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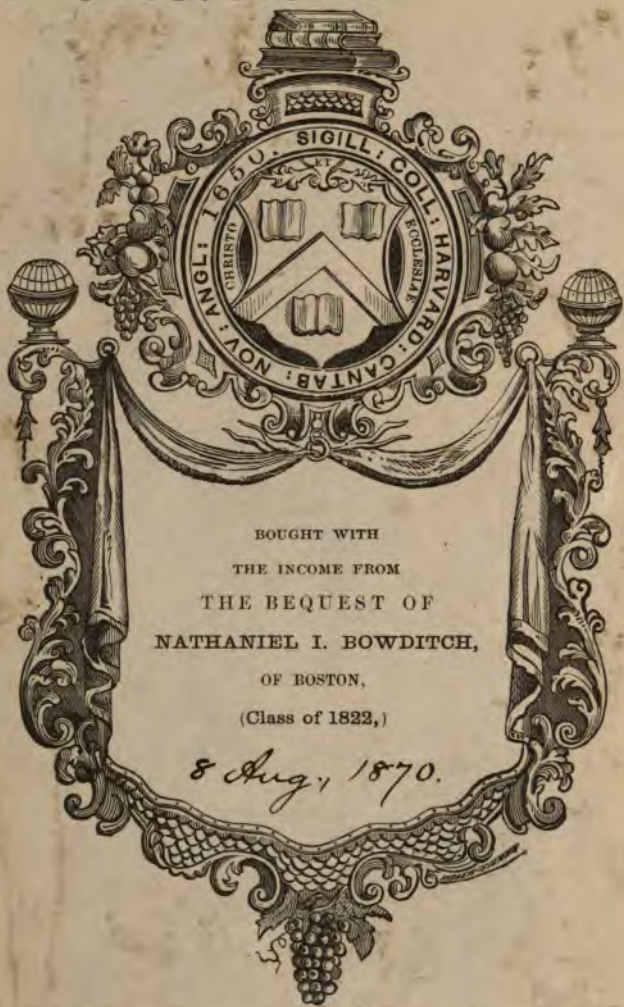
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8 Aug. 1870.



LOWER FORMS OF LIFE FROM NATURE.



Fungus agariciformis.

Branching coral.

Fire frog.

Argonauta argo.

Pholas dactylus.

Pecten opercularis.

Malleus vulgaris.

Millepede.

Scorpion.

Common frog.

Edible frog.

Donax.

Spondylus.

P. opercularis.

Mollusca crab.

Purple emperor butterfly.

Locusta migratoria.

Death's head moth.

Solen.

Anomia ephippium.

Cassis.

Mitra.

Spurge hawk moth.

Purple emperor butterfly.

Locusta migratoria.

Death's head moth.

Solen.

Anomia ephippium.

Mitra episcopalis.

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THE BOOK OF NATURE

AND

THE BOOK OF MAN.



Wrynecks.

Creepers.
Nuthatches.

Wrens and nest.
Wryneck.

Illustrated with Photographs and numerous Woodcuts.

THE BOOK OF NATURE

AND

THE BOOK OF MAN,

IN WHICH MAN IS ACCEPTED AS THE TYPE OF CREATION—THE
MICROCOSM,—THE GREAT PIVOT ON WHICH ALL
LOWER FORMS OF LIFE TURN.

BY

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LOUIS FIGUIER'S "OCEAN AND VEGETABLE WORLD," ETC.

WITH A PREFACE BY THE LATE LORD BROUGHAM.

Illustrated with Photographs and numerous Woodcuts.

LONDON:

JOHN CAMDEN HOTTEN, PICCADILLY.

1870.

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1870, Aug. 8.
Bowditch Fund.

"THE sublime capacity of thought, through which the soul, smitten with the love of the true and the beautiful, essays to comprehend the universe, soars into the heavens, penetrates the earth, penetrates *itself*, questions the past, anticipates the future, traces out the general, and all-comprehending 'Laws of Nature,' binds together by innumerable affinities and relations all the objects of its knowledge, rises from the finite and transient to the Infinite and the Everlasting, frames to itself from its own fulness, lovelier and sublimer forms than it beholds, discerns *the harmonies* between the world within and the world without us, and *finds*, in every region of the universe, TYPES AND INTERPRETERS OF ITS OWN DEEP MYSTERIES AND GLORIOUS INSPIRATIONS."—Dr. Channing, of Boston.

PREFACE

BY THE LATE

HENRY LORD BROUGHAM AND VAUX.

IT has been my great pleasure to read this work, which I think will not want any commendation from me to render it a favourite.

I think the leading idea a very reasonable one. Man is undoubtedly the "MICROCOSM." The immense mass of facts collected in this book will I think render this plain to most persons. I have read the chapters on Botany, Zoology, Geography and Geology with great interest. Those who are not prepared to go with the author in all things, cannot fail to be impressed with his eloquent treatment of the subject. I am at a loss to remember at present, any book on Natural history more powerfully and graphically written than "The Book of Nature and the Book of Man."

He is entitled to the credit of great originality, as the systematizer and reducer to a science, of an idea, old as that of the Greek sages; but which has hitherto been treated only in a desultory manner by poets and metaphysicians of the German school. I see he makes some remarks (page 206) on the Lord Chancellors: I hope he does not intend to be personal.

The book unfolds a course of thought which if I were a younger man, I should like to pursue carefully. Alexander von Humboldt would have been much interested in this work, as the style of argument reminds me of that which occupied his attention* in the early dawn of the science of this century.

The Author has strode the gulf between physics and meta-

* "While the difference of sexes in all living beings beneficently binds them together in prolific union, the crude matters of inorganic nature are impelled by like instincts. Even in the darkness of chaos, matter was accumulated or separated according as affinity or antagonism, attracted or repelled its various parts. The celestial fire follows the metals, the magnet, the iron; amber when rubbed attaches light bodies; earth blends with earth; salt separates from the waters of the sea and joins its like, while the acid moisture of the *stypteria* (στυπτηρία ὑγρὰ) and the fleecy salt Trichitis, love the clay of Melos. Everything in inanimate nature, hastens to associate itself with its like. No earthly element (and who

physics, mind and matter, instinct and reason, God and Man ; for his scheme of reconciling the Mosaic narrative with modern Geology, possesses advantages over those of his predecessors. He justly asks, presuming the Mosaic account of Noah's flood to be true, what the animals preserved by him in the Ark fed on when they came out of it. For it is idle to suppose that Noah himself fed these animals, during the many generations required for them to be mutually supporting.* His theory of the relation of Man to lower forms of life I like better than Lamarck's, and his theory of the Compound Unity of Man's mind I think will be of great use to the metaphysician. It is wholly new to me, as is his classification of the three kingdoms of Nature as "Moral, Organic and Inorganic."

Notwithstanding the intricate nature of the subject the style is simple and readily intelligible.—It ought to be highly popular. It is not unscientific because it is eloquent, or foolish because it moves our feelings. But in the words of my old friend Lord Jeffrey, "Though the sails are all purple and the prow of beaten gold, yet they waft on the voyage none the less, and more surely than if made of baser materials."

There is but one question I would ask the author, is the spiritualism of this work foreign to our materialistic, manufacturing age?—No ; for amidst the varieties of mind which divers circumstances produce, are found those who cultivate man's highest faculties ;—to these the author addresses himself. But even in the most cloudless skies of scepticism I see a rain-cloud,—if it be "no bigger than a man's hand ;" it is "Modern Spiritualism."

will dare to class light as such ?) can therefore be found in a pure and virgin state. Everything as soon as formed hastens to enter into new combinations, and nought save the disjoining art of man, can present in a separate state ingredients which ye would vainly seek in the interior of the earth, or in the moving oceans of air and water. In deal inorganic matter absolute repose prevails, as long as the bonds of affinity remain unsevered, and as long as no third substance intrudes to blend itself with the others ; but even after this disturbance, unfruitful repose soon again succeeds."—"Vital Force," in Humboldt's *Views of Nature*, p. 383.

* See p. 423.

AUTHOR'S PREFACE.

"MAN was made in the image of God," of an omnipresent omnipotent Being, and as such the type, the embryo of what is universal, at least as regards this world. This proves our proposition Man—the Microcosm. The impersonation—the representative man Christ, alone fulfils all the requisites of the Microcosm. But the most insignificant man indelibly stamped with his Creator's image, lives throughout all time, the epitome of the world he inhabits. What are the ties, the links that bind man to earth, that shadow forth his characteristics? In the Inorganic world we see his qualities portrayed with a precision and a simplicity, suitable in elements; in the various classes of organisms we see the leading characteristics of man, shadowed forth; and in the representative species representative men. One fact must be borne in mind, analogy often ends where resemblance begins: and where an actual resemblance is found between men and the higher animals we are forced in many cases to admit that the influence of man is here more directly seen: they reflect his image and refract it back to him.

Some writers have thought of Man as "the Microcosm," either by a direct attempt to view him in this light, or through incidental allusions. The subjects presented in the following pages, are with reference to Man and Nature, rather than with regard to Man and Books.

An attempt has been made to show how the Geographical features of a country and its Vegetables and Animals, harmonize with its human inhabitants; after which the Analogy between the great classes of organisms and the structure and habits of Man will be drawn. In the latter part of the work the analogy will be shown between the Chemical composition of substances and man's Constitution, and the analogy with the Chemical elements and those in human society, and between Geologic and human history.

Professor Huxley, in his Presidential address before the Geological Society for 1869, says, "I conceive Geology to be the history of the earth in precisely the same sense as biology is the history of living beings ; and I trust you will not think I am overpowered by the influence of a dominant pursuit, if I say that I trace a close analogy between these two histories."

Mr. Luke Pike, in his paper "On the claims of woman to political power" (Jour. Anthro. Soc., Ap. 1869), acknowledges the truth of the analogy between Chemistry and mind. "Chemistry"—says he—"illustrates the subject (of mind) better than any other science. Not only may the same elements mingled in different quantities, produce substances of different properties; but the same elements, even in the same proportions, may, under different circumstances, yield dissimilar products."

But the views of both these writers were expressed by me before the Anthropological Society on April 16, 1867. And before the Bristol Natural History Society, October 11, 1866. And very fully in a lecture before the Philosophical Institution of Bristol, January 14, 1867.*

In many cases in this work analogies are drawn; in many types; and in some few instances, actual resemblances are pointed out; which diverse character of illustration may be described as cords of greater or less rigidity which form the tie between Man and his *Earth*.

A chapter will be given on the analogy between Moral and physical Optics.

This work was written many years since, and the author acknowledges his obligation to the late Right Honourable Lord Brougham for the highly flattering prefatory critique on the manuscript of the work.

It was the intention of the author to have given a large number of extracts and references in illustration of the various subjects in this work, but they have been withheld (only for the present) for want of space. The following authors have written in a most interesting manner on the resemblance between man and animals: Aristotle, Camper, Vesalius, Porta, Haller, Buffon, Spurzheim, Da Vinci, Aldrovandi, Lavater, Redfield, and Fowler.

* Reported fully in the *Daily Post* (Bristol) for Jan. 15, 1867.

NATURE AND MAN.

INTRODUCTION.

MAN THE TYPE OF CREATION—PROGRESSIVE CREATION—CLASSES AND AGES
COMPARED—THE PHYSIOGNOMICAL METHOD OF STUDYING THE SCIENCES
—THE PHILOSOPHY OF HEAD-FORMS—CREATION OF INDIVIDUALS AS OF
TYPES—THE BATTLE OF LIFE—THE TRIUMPH OF TRUTH.

TWO great methods of scientific analysis have been propounded by two great men—Aristotle and Bacon—whose names are to science what those of Giotto and his predecessors are to art. Aristotle's method was argumentative ; Bacon's, experimental. Aristotle's mode of reasoning, although often logically perfect from premises, was not based of necessity on actual fact ; but Bacon stands forth, throughout all time, the grand exponent of experimental and inductive science, strongly urging the necessity of forming conclusions on this basis only. And he has succeeded in convincing the scientific world of the justness of this in theory, however strong the tendency of mankind may be to forget the lessons of experience, and to return to the philosophy of assumption.

It is but little that one man can do : representative facts and principles are therefore all that one mind can grasp in nature. Hence, as man surveys the different departments of nature, he inquires for types of them. These types are representative, and afford illustration for every other department of knowledge, whether usually supposed to be connected therewith or not. Still, all are mentally investigated by the same faculties, which give them a common stand-point. We hope to show, in the course of this work, the truth of this great principle, that the philosophy of mind is the centre or key of the philosophy of matter.

The portion of natural phenomena the mind of man can grasp is but small. " 'Tis but a part we see, and not a whole ;" and as it is only a grasp of a whole that can enable us fully to enter into and apply the Baconian system of philosophy, we are

thrown upon what we see, or upon the angle of vision at an ever-increasing radius. We judge by what we see, by the outside of things only, therefore our method of investigation is physiognomical, and not always, strictly speaking, "Baconian." Use experiment wherever possible, but man must still judge, as he has continued to judge in past times, by the outside of things, which, rightly considered, affords an index to what is unseen.

Man has always been a "physiognomist"—that is to say, an interpreter of signs. Some branches of knowledge are studied almost entirely physiognomically—as geology, founded on the crust of the earth, and yet pointing down to the invisible interior. The classification of man on a philological basis is mainly physiognomical, as its elements are arranged in accordance with signs possessing a resemblance, themselves pointing to processes of mind of similar origin.

The character of man and animals, developed in their actions and habits, can be further read in the outline of their forms. This last process is what is commonly understood by "physiognomy." Man has always acknowledged indication of character by form, but, like every other feeling common to him, it requires reduction to order and rule. The first step necessary in the "physiognomical" study of a subject is a knowledge of the character and properties of the elements of the subject, or, if this is not possible, of subjects allied thereto. Personal physiognomical examinations are many times more valuable than those at second hand, answering to reflected light—for there is great difficulty in describing physiognomical signs in words. If forms are the index of so much beyond the mere superficies, we are led to consider what special signs stand for special things, to ascend from the sign to its signification, and again descend backwards to the sign.

In considering human physiognomy, our course of reasoning first leads us to the consideration of what is common to man, which is exemplified in his outline as a being. His proportion of qualities as an individual is to be traced in his varying outline. The outline of every part of his body is highly significant. Foot, hand, trunk, head, and every part of it; skin and hair,—all, by their variations, indicate the varied characters of men.

As we have said, form in nature is significant of much more than, at first sight, we are willing to admit. We shall instance, as an example of this, the principal head-forms which are associated with special types of character amongst mankind. The student may read at a glance the rough outlines of the characters of those he meets with by the form of their heads.

The writer has found it very convenient to call the principal varieties of head-forms the Round, Long, and Narrow Oval (shaped like a flattened egg), Wedge-shaped, Square, Wide, Long and Short Prognathous, and Pyramidal. Some of these forms are characteristic of races, others of individuals; they all accompany marked mental peculiarities, most of which have been verified by observations on the inhabitants of England and France.

The present population of the British Isles thus displays a great variety of head-forms, which accounts for their wide diversity in character. Our remarks on the varieties of character which accompany head-forms are more general than special, for the survey is too short and inclusive to admit of much detail or nice accuracy, and the extreme types cannot be always found at a moment's notice.

The Mongolic devastators of India and Persia had round heads, somewhat modified by the pyramidal. We proved this by measurement of skulls from the tombs of the Indian kings of the Mogul dynasty, and the comparison of them with coins and drawings of sculptured heads; the Mongols of the present day have this type of head. The Moguls conquered, but they did not impart their language; they crushed rather than developed the resources of nations.

The Round head is accompanied by a tendency to extend and migrate, and with less attachment to home and offspring than either the oval or narrow types. Men with round heads accomplish much to a certain extent, and easily organize, but show far less capacity for individual improvement than those with oval heads: they cannot settle, they must roll. "A rolling stone never gathers any moss," or leaves a permanent impression on the ground it traverses. In like manner, men or races with this configuration may be great as conquerors, but do not influence society, like those with sharper and more angular heads. Nations with round heads are driven before those with hammer- or wedge-shaped heads, who find, however, difficulty in dividing or detaining them; for rotundity here, as well as in physics, is accompanied by a strong principle of cohesion. The hammer strikes the ball, which flies, but may rebound and strike its assailant. The old conflicts between Europeans and Mongols, and the modern between Russians and Turks, have often been of this character. The Russian and Teutonic heads are much longer than the Turkish. Round-headed people are difficult to manage, for they are not influenced by those economic instincts which induce the semi-savage to become a useful servant to civilization.

A few Englishmen and Scotchmen have this round type of head; they have much energy of character, great obstinacy and

bigotry, and are deficient in practical wisdom. This form of head is common in Spain, and perhaps points to a Mongolic affinity in the aboriginal population of that country; but it must be allowed that this also approaches the Moorish head-form.

The Greek form, or Oblong skull (a subdivision of the square), does not rise on the crown like the round head. Greeks are deficient in that stability and consistency which characterize the round-headed nations; but the superior length of the Greek head, especially between the ear and the frontal sinus, gives it vastly greater intellectual power. The Square is the commercial, manufacturing, and contracting head. The Greeks show many of these characteristics.

The Round oval is the highest type of head, being distinguished for beauty and accompanied by great moral, intellectual, and physical powers. It is well shown in the portraits and busts of Shakspeare, Melancthon, Milton, Oberlin, and of many a sage, both in ancient and modern times. In this type the intellectual and moral faculties preponderate, but the selfish and domestic propensities are not relatively deficient. It is the Celtic-Scandinavian type, but it is found amongst the truly great of all nations.

There are two important modifications of the oval. The first has been termed the Long Flat Oval, and the second the Short Flat Oval head-forms. Men with oval heads which are flat at the sides, either long or short, are commonly more fond of literature and science than of the mechanical arts; they are not generally fit to be at the head of a commercial business, although their intellectuality and relatively weak selfish propensities render them little liable to be overcome by temptation to fraud in places of trust. They may, notwithstanding, from the tenacity of their memories and their orderly habits, make excellent clerks, and are willing, in many cases, to work for much lower salaries than those far inferior to themselves in intellectual power, but who possess broad, that is, selfish, heads.

The portraits of the late Sir Walter Scott and Mr. Craik, the eminent scholar of Bristol, well illustrate this form of head, as do their characters the psychology that accompanies it. This form of head is associated with strong domestic affections and great stability of character, unlike the short-flat oval, which indicates considerable intellectuality of a superficial kind, but little depth of feeling or concentration of power.

The Wedge-shaped head is divisible into the Long-wedge-shaped and the Short-wedge-shaped.

The Long-wedge is very common amongst persons of Gaelic descent. Its greatest width is about an inch before and an

inch above the mastoid process. It has great length between the frontal sinus and the ear, sometimes as much as five and a half inches axis. It has a general flatness on the temples and above the cheek-bones, which are often high. The qualities which accompany it are perseverance, singleness of mind, and acuteness; but with little moderation, sagacity, commercial wisdom, or mechanical ingenuity. Such persons, like the wedge in mechanics, may be ready agents for demolishing what has been united for ages; but they have little power of re-uniting what they have divided. The wedge in mechanics can do nothing unless it receives an external impetus, and the wedge-headed peoples are more powerful and prominent when they are inspired by a mallet-headed nation. The Celts of Ireland, generally wedge-headed, received increased activity in contact with the mallet-headed Normans.

Individuals with the Short-wedge-shaped head resemble the long-wedged in their deficiency in practical wisdom and commercial acumen, and are equally active as opponents; but, being liable to alter their course, they cannot be relied on as partisans. The better specimens of individuals with the Long-wedge-shaped head have often great capacity for analysis, but are relatively deficient in the power of logical demonstration. Persons with the Short-wedge-shaped head have not the same ability for becoming historically acquainted with a subject as their longer-headed brethren, who are often highly gifted in this respect.

The Square head common in Great Britain is often of a large size; it is nearly of the same width all along the sides, and is the accompaniment of great prudence, enterprise, and working power. Individuals possessing this form of head, which is at the same time depressed on the crown, are apt to have a low moral standard, and are not so likely as those with high heads to attain an elevated position. Wealth may be obtained by a man with a broad but low head; but selfishness and a tendency to fraud are often seen in such an one. Most persons who make money fast, who are successful contractors, or who originate profitable manufacturing businesses, have square heads.

A head wide over the ears, low on the top, narrow and low on each side of the forehead and in the sincipital region, is most commonly found in depraved characters, criminals, and malefactors. Individuals having it, often possess great muscular strength, but require the government of others or they soon wear out; force is the only logic they understand or practise.

The Pyramidal head described by Dr. Prichard, rises in the form of a cone or pyramid from the ears to the crown: it may

be said to be most characteristic of the Mongolic races. In the Laps and Esquimaux it is found in its purest forms. The pyramidal type is accompanied by a narrow bigoted mind, having little capacity for science, but possesses great aptitude for handicrafts. In the Chinese it is modified by the square, and in that nation we see bigotry, obstinacy, industry, and commercial acumen combined.

The Long and Short Prognathous forms, characteristic of the heads of the Negroes of Africa and the Oriental isles, are mainly confined to them; but individuals of European descent, having long or short heads, occasionally show some approximation to this type. This is partly occasioned by the small size of the chin, which does not give room for the teeth; they thus project in an unsightly manner. This was most probably in the first instance produced by ill-assorted marriages, which resulted in the teeth characteristic of one parent being communicated to offspring, but without sufficient space for their location. Of this we could name several cases which have fallen under our observation during our researches in family history. Prognathism appears to be usually the accompaniment of but a small power of self-government. Amongst the Blacks, it is characteristic of a race (Negroes) who have little self-control, and amongst Whites of a small share of that resolute reticence which accomplishes great things. The length of head from the ear to the occiput indicates the strength of the domestic propensities. The Negroes of the Congo River, and other tribes, have this region largely developed. Their domestic affections are strong, unlike those of the Oriental Negroes or Negritos: they possess the short form of the prognathous skull. A habit of showing teeth, in the animal kingdom, is a very general accompaniment of ferocity, as exemplified by crickets, the Felinidæ, bull-dogs, gorillas, and Negroes.

Slight variations in the head-forms described are accompanied by slightly different qualities, but still the deductions, though somewhat wide, are true on broad grounds.

If man is a type of the universe, and if the science of his mind is a type of all the other sciences, the physiognomical principle must be applicable to the study of science in general; for science does not consist of divisions entirely distinct, but of many branches proceeding out of one tree—man's mind. Chemistry hangs on zoology, botany, mineralogy, and optics as much as they do on chemistry; and even mathematics, which it has been the fashion to isolate from other sciences, contains the principles of many. Isolation, impossible in fact, is injurious if attempted in theory; hence the disadvan-

tages of a mainly mathematical education, which is not a soundly scientific one, as the principles of mathematics are dependent in their application on facts scattered throughout a great many branches of science. Music is dependent on number, time, and mechanics, as well as on sound, itself a mechanical process. Geometrical measurement is equally dependent on variations of temperature. As the science of mind is the centre of sciences, its study becomes the most important of studies, but its position as such is little acknowledged. The principles that regulate every branch of study are taught diligently as necessary to that study. It should be the same with the study of mind.

It is still further sought by some not usually superficial, to isolate general science from theology, as if one class of facts could contradict another, and the revelations of the Deity oppose the discoveries He permits man to make. A slight colouring for this erroneous course of argument, is afforded by the use made by the Deity of national minds or modes of thought, prevalent in given ages. It is surely somewhat difficult to translate ideas prevalent at the earliest stages of society into modern language, so as to correspond with all modern trains of thought: but these difficulties do not detract from the value of a truth of a religious or scientific character, but merely call for our careful and conscientious consideration, which, when given, "a flood of light" is thrown on the past and present, although viewed as it were through different lenses or combinations, the ancient and the modern.

The tendency of individual minds is to give undue importance to their special aptitudes—that is to say, the sort of argument which they individually most appreciate—so that distortion or exaggeration of favourite processes, and consequent depreciation of others, is the result. Few individuals possess evenly-balanced minds, capable of giving their due weight to all different classes of argument. Some are mainly led by the intellectual faculties, others by the moral; others, again, by the domestic, and some by the selfish propensities. All these diverse qualities assist and are equally necessary to the investigation of truth, but the too greatly predominating influence of the intellectual, or even of the moral or other classes of faculties, leads us away from truth. The most perfect man is he in whom all the faculties are nearly balanced, and of sufficiently great power and inclination in a particular direction to incline others as he is drawn himself. Such minds should be accepted as leaders, if any are.

"Oppositions of science, falsely so called," are generally experienced by minds either ill-balanced or of an inferior

order. Balance and harmony, more excite our admiration and command our respect, than the highest qualities which form part of an incongruity. This is as true in human character as in works of art. But great proportions must be displayed to command much influence.

In a work which accepts man as the type of creation, and points out many illustrations of the doctrine that he is its great centre, it is certain that many different classes, species, and divisions of the great kingdoms of nature may be found to illustrate the same part of man's nature, or the same division of man's race, or the same class, out of the many classes, into which each race or nation is divided. And so it must be, if every class in nature is to find its centre in man.

Minute shades of difference in typical illustration could doubtless be found, but in a subject so wide as this, merely an attempt can be made to gather together some of the bricks, mortar, and scaffolding necessary to begin the foundation; a complete edifice fills the universe, and is the dwelling of the universal man.

"Mark his majestic fabric: he is a temple
Sacred by birth, and built by hands Divine;
His soul's the deity that lodges there;
Nor is the pile unworthy of the god."—*DRYDEN.*

And surely he is a type of the God of the universe.

Some persons may, perhaps, suppose that, in works which endeavour to unfold new or little-known methods in philosophy, the resources of rhetoric are not required, and would advocate a bare statement of facts. But what do we see in nature? All is living here: the trees and animals flourish and pass away, but their elements are immortal; the candle of life may be smothered, but its extinguisher cannot cover nature. Why, then, such an attempt? Why such an inversion of God's order? He did not leave the skeletons bare or the leaves faded, but gave to all a natural garment, glowing or dusky with the daylight or the twilight. Some men (of science?) are satisfied if they can but draw the outlines of the skeletons; but this aspect of nature, repulsive to the common man, is not the less so to the "true naturalist," who, while he expects to see the skeleton as a foundation, shrinks from a parade of baldness and bare bones; and thus many a student of nature avoids the naturalist's library as he would a charnel-house. Then let us hoard the glittering dust which the naturalist has discarded—the spoils of the sunbeams. His prodigality but enables us the more easily to make our fortunes. Yes, "hold up the mirror to nature," and see her reflected there in all the linea-

ments of life. No cold gray outline is there; the frame of a living being, but wanting all the glowing tints that seem to breathe.

Nature is the herald of man's actions, the Earl-marshal of his dignities and his deeds. From very early stages in society animals, plants, and minerals, symbolizing his qualities, have been adopted as his arms. This work is but an heraldic dictionary, not of a class, an age, a nation, but of man.

Two systems of classification have prevailed: the artificial and the natural. The first may be called the *inorganic* classification of organisms, which are thus degraded from their lawful position. Next followed the NATURAL SYSTEMS, which admitted their habits and instincts as one element of their classification. But even these last-mentioned systems mainly adhered to dead anatomy as the basis of arrangement. Is there not room for a classification which principally considers mind in man, and instinct, habits, and properties amongst the lower forms in nature?—for a moral system rather than an anatomical system?—for one that regards anatomy chiefly as a tabernacle of flesh and bones? We are told in the Scripture that “the sabbath was made for man, and not man for the sabbath,” which is in accordance with the principle that instinct, mind, and morals should have the first consideration in the formation of systems.

The typical significance of the three kingdoms in nature is great. If we see in the mineral kingdom man's bodily constitution, and in the vegetable his animal life, so in the animal do we see the life of his spirit typified. And as we advance and examine every step made in the animal kingdom towards a higher life, we see an illustration of man's progress. His physical progress is powerfully and strongly shadowed forth, but his moral progress is so still more.

Plants, we have said, are a type of the animal life of man: their growth is similar; they derive their subsistence from earth, air, fire, and water. Fire is represented by the temperature required for growth: the air supplies a portion of the nitrogen and oxygen so essential; while the carbon and salts are derived from the earth, and the hydrogen from the water. Similar laws govern the sustenance of living animals; and, to extend the analogy further, they sustain the mental life of man. Corporeally he requires the aid of all these four agencies, anciently called elements. The sustenance of his mind may be contrasted with that of his body. Thus man is equally dependent on the moral, as on the aerial or gaseous; on what is intellectual, as on the fluid; on the emotional, as on what is glowing, ardent, or fiery (caloric); and on what is domestic, as on the earthy.

This is but another view of the four temperaments as analyzed by ancient writers.

When we compare the ages of man's history with the different classes of animals, we see that the same analogy in great detail pervades them both. Thus in the lowest Infusoria we see a type of the world in the days of Adam after his fall; while the Polyp class is an illustration of the generation from Adam to Noah, gradually progressing. A great step was made by the builders of Babel, who, like the Echinodermata, first began to be covered with a shell or house. The period of the Entozoa was a progressive stage, but smaller and insignificant, and well illustrates the divided minute nationalities into which men were separated; while the Rotatoria, a connecting link with far higher classes, typify the approach to civilized life on which nations entered as they commenced a period of profitable activity. Nations had now begun to whirl on the wheels of separate existence towards that great goal, the development of man. The Ringed-worms are typical of the degraded life of these early nations; but some rose high in their class, so as to become representatives of the more elevated of mankind in a dark age. The insect order, in which most of the creatures are very small, yet very ingenious, reminds us of the age of small tribes but great inventions; while the Crustacea, inhabiting the water, suggest the life of the earliest mariners. The Mollusca are comparatively helpless, and have few influential members capable of accomplishing great deeds. They typify weak, flabby nations.

The first establishment of great monarchies, like those of Egypt, Assyria, and Chedorlaomer king of Elam, are typified by the commencement of Vertebrata, or a class having a backbone. The government of the Israelites in Canaan, and of the early monarchies of Greece and Rome, may be illustrated by the birds; while the reptiles are in all these ages of vertebrata the type of what is degraded and corrupted. Lastly, come the quadruped Mammals, which, in the four symbols of Daniel, are made to exemplify the four monarchies; while the reign of man is illustrated by the commencement of the kingdom of Christ—the only period of the true rule of man: for, when under the influence of his passions, he is not his own master. We shall enter more fully into this illustrative detail in the body of the work.

It is a much higher attainment in a naturalist to discover the balance and mutual dependence of the various divisions in nature than to catalogue or even to describe new species, perhaps on grounds mainly arbitrary, as time and place—to

raise a monument of artificial ear-splitting nomenclature—a house of card-labels, to crumble in the next age. But he who discovers the vital compass, gains a knowledge of those poles round which orbs of life revolve. Man himself is a sun; the vegetable cell but his remotest satellite.

In systems of classification, the true system of nature is sometimes but little considered; although they are called “natural,” they are almost purely *artificial* systems, written and contrived by ingenious men, who saw the necessity of some sort of arrangement, in accordance with the principle, that, in order to learn things distinctly, we must carefully individualize, or take up one by one. We follow out this principle, and find that we accumulate a mass of facts which obviously differ, and resolve themselves into different classes. This is the natural effort at classification, and more or less presents itself to every human mind which uses its faculties in arranging the materials of thought it has acquired, in observing the phenomena of the world. The Moral system of classification proceeds on the same principles as our Physiological systems, that is to say, to classify by resemblances and differences.

We accept as sound the principle of physiological classification, as a method of discovering the affinities of genera and species. On account of our deficient knowledge, such a method of division is at present very imperfectly carried out. An effort will be made to show that many links which are missing in our physiological systems can be filled up by typical illustrations derived from the moral world, intended to prove the connexion between the earthly and the spiritual, the material and the mental. The chain of analogy that surrounds nature we believe to be unbroken, but the short-sightedness of man, the dust that has accumulated for ages, the vapours arising in ill-conditioned minds, and the fogs which long hang over “the unexplored,” have hidden this immortal fact. The links which to our sight appear broken, as we survey the chain, are surely many. But we must not look for the whole chain of nature to be within our grasp at present. Many links, now hidden, are discovered as having existed in past ages, and many may be developed in ages yet to come. This chain extends from the beginning to the end of Creation; it is sometimes drawn loosely, and at other times it forms a rigid line.

The Spirit of the Creator presides at the communication of life to every individual of a species, and over every combination of elements, or over the very forces produced or producing every cognizant or incognizant event: this is the Doctrine of Peculiar Providence.

Begin with the simplest combinations of elements, and the lowest forms of vegetable and animal life, and rise to man ; the same Creator of the elements presides at their combinations, and the same Creator of specific organisms adds to their number as individuals. Species are but the agents through which life is communicated ; the presiding cause and the source of life is near, but distant. The same is true with regard to chemical combinations, which derive their affinities from the same source. This great fact of the perpetual creation of life and combinations, explains the incomprehensibility by man of the essence of life—which is God.

There is a great focus of creation, as well as a great focus in creation ; the central habitation of the GREAT PRESIDING SPIRIT, round which stars revolve, and worlds as numerous and comparatively insignificant as motes in the sunbeams, which also owe their visibility to a great focus of light.

Types of man's character are illustrated in all departments of nature, from the geometric cell-like plants, which float in fluids, all angles and corners, requiring a microscope to bring out their traits of character, to the apes which most resemble man in form. These last imitate his gestures and habits, but, like many persons who "ape" those above them, never attain to their perfect performance. The accompaniments of decomposition in animal and vegetable infusions, INFUSORIA, though necessary and useful in a *low* position, are quite unfit for a *high*. They often require to be removed, and should not be stirred again with "the mother-liquor" from which they sprung, on which they would act injuriously. They typify "the scum" of the population, that rise to the surface in countries "ventilated" by the press, which, if removed for the use of other lands, may effect great good, but, if allowed to remain where they are, tend to the disintegration of the parent state. The Hydra, all-devouring, bearing a star, is placed next to the Infusoria in some systems of classification ; they have little solidity but enormous grasping power. They appear to point to a new rule of arithmetic, for they are multiplied as they are divided.

The Coral Polyps accomplish much, and show what great works the smallest creatures can produce when they co-operate in vast numbers. Is little man to sink his individuality to execute what is great as a community ? The Pyramids of Egypt ask us this question. The leech was formerly acknowledged to have its counterpart in one of the learned professions. What Elizabethan writer does not mention "*a leech*" ? It was thought to be a most miserable end for Herod to be eaten of worms. Are not leeches worms (annulose animals),

which are never satisfied till they can hold no more? Their application to the living recalls the lines of Byron :—

“ It is as if the dead should feel
The icy worm around them steal,
And shudder as the insects creep,
To revel o'er their rotting sleep,
Without the power to scare away
The cold consumers of their clay.”

It is absolutely certain that the soon ripe in nature soon decay, and that those late in bearing fruit last the longest. This analogy pervades the moral world as well as the organic, and still lower down the inorganic. Crystals slow in formation retain their form longer than rapid crystallizations. Infusoria, slowest in development, build up our mountains, their skeletons forming the grandest monuments of extinct organisms. Insects, the most powerful as individuals, like the Mantis and the larger Coleoptera, often require years to attain their full development.

The bees, the ants, the wasps, the most intelligent of insects, require much tending in their infant days, but yet their works prove what they can do in their maturity. The reprobate aphides, the lice of plants, live but a day, and multiply as soon as born—the type of those whose youth is stained by violations of natural laws. And mollusca, long in attaining even moderate size, longer in breeding, live many years. Every plant that survives centuries blooms but seldom; its flowers and seeds are small, and modest shields protect the fructifying germ.

The highest members of the various classes of organisms, like the most elevated among ourselves, show the greatest regard for offspring. The seeds of the highest plants have much protecting covering. Among the reptiles, the python, grandest of its order, hatches its eggs; and the crocodile, the largest recent lizard, is said, unlike the lizard tribe in general, to break the shell covering its young.

The sharks, the grandest of the fishes, protect their eggs in cases, and twine them among the seaweed, to which they cling as to a foster-mother's skirts. The whales, the great mammals of the deep, the giants of life, long protect their young, unlike the vast number of the fishes, who never approach them in intelligence. These mostly cast their spawn, the seed of their young, in the waters, and leave them to work out their own destiny, or watch to devour them.

And so the birds, who love their young most, like the condors, tend them with untiring care; see them soar up to pierce the “vaulted sky” that snow-peaked Chimborazo pillars. Thus the young warblers of the grove unite their voices with their

parents ; their simple offerings to heaven, rising on morning mists, repaid by evening dews, from that portal, as it welcomes in their vesper sacrifice. Such are the birds whose young must live in nests formed by the industry of their parents. They are mostly naked when hatched, for the beautiful feathers of the parent-birds are not even represented by much down, such as covers at birth the running and the swimming birds, whose habits are more earthly.

Then come the quadrupeds in whom prevails the same analogy to man. The guinea pigs, and others still lower in



A GUINEA PIG AND FAMILY.

the scale, do not tend their young with the same care as the elephants and monkeys, which long cherish their offspring with more care than some human beings. Years elapse before they separate from the family haunt, and perhaps before they leave they see a troop of younger offspring of the same parents. All this teaches us that the highest members of every class in nature display the strongest clinging affinities. The noblest trees are the most deeply rooted in the parent soil. The precious stones and the bright metals cling to their matrix with tenacious grasp. Forces must "rend the bowels of the earth" to tear them from that mother's side that gave them

birth. And as we rise to man, through all the devious links, from class to class, and choose the noblest, each shows the strongest family instincts, binding young to old and old to young. And so all nature shows without reserve that the crown of every class is given to those who protect their offspring most.

He who acquires knowledge of the different kingdoms of science gains bloodless victories over them. He is a conqueror, as great in his way as Cæsar or Alexander, and may possess an empire as vast as that of William III., and by right as stringent as that of conquest. The United Kingdom is a type of man's constitution. The main body is Saxon, the soul is Celtic, while much of the spirit is Irish.

We divide Nature into Three Empires—the Inorganic, the Organic, and the Moral. He who first breached the artificial walls which encompassed these three great domains did much if at the end of his life he put his foot on the threshold of each. But the young man may now do this in the days of his youth. He may indeed breach the walls of these great fortresses, and apply the scaling ladders on which others have climbed before, every step having been perhaps the work of a long life now passed away. He ascends and takes possession of vast treasures, and finds how to his mind the artificial walls have crumbled; and as long as he lives he sees them crumbling around him, and assists in the work of demolition. In proportion as he does this is his power consolidated, and his true domain extended. He attends to the "order of nature," and sees how this Vast "*inseparable Unity*" has been *wisely divided*, that its parts may be within the grasp of the smallest and most insignificant artificers, who fly in at the breaches made by those typified by the first who scaled Badajos.

The original mind frequently rejects the beaten tracks of science. It sees before it the summit of knowledge and of fame, which the common mind, viewing the rocky crags that guard its approach, pronounces "inaccessible." The peak of the Matterhorn was long regarded in this light, but six adventurers, scorning "impossibilities," attained the top. A hero's course is run when he has won the battle. Four fell, and two were crowned victors. An early grave thus often awaits the gallant and the enterprising; yet in our climate let us hope the sod will be always green over their ashes, until the Inorganic, the Organic, and the Moral kingdoms rise in resurrection. Then will the fruits of all these conquests be realized, and then will the triple crown of the three kingdoms be bestowed: that of the glorious flame of life, the type of the spirit; of the "bay

ever-green," of the "olive ever fresh;" types of organic life, ever living, and these united by a diadem of everlasting gold, the Inorganic Crown.

But the conqueror may return in triumph from the war, and receive from a grateful country the reward of his labours. Napier the Fifth, burning to deliver Britannia's children from the nest of the Abyssinian vulture, climbed to the heights of Magdala. "He read their history in a nation's eyes," and, among the many wreaths showered upon the hero, a simple-mottoed laurel outlasts them all:

TRUE TO HIS NAME, HIS COUNTRY, AND HIS FAME.

The struggle for a virtuous existence, the triumph of higher over lower forms of life, the triumph of truth over error, of honour over craft, is well illustrated in the story of St. Michael and the Dragon, so often represented by painters of the Italian schools. We have chosen the world-renowned rendering of Raphael as our frontispiece, as giving better perhaps than a modern conception this typical contest; for we see typified in the beautiful and majestic figure of St. Michael the noblest, the divinest aspirations of man in the ascendant, and in the brutalized figure at his feet the impersonation of human villany; although once clothed in the majesty of a transcendent demon, and characterized by an everlasting opposition to the laws of God and of nature, yet now incapable of injuring any but the base!

Truth must triumph in the end, and the highest form of life must conquer.

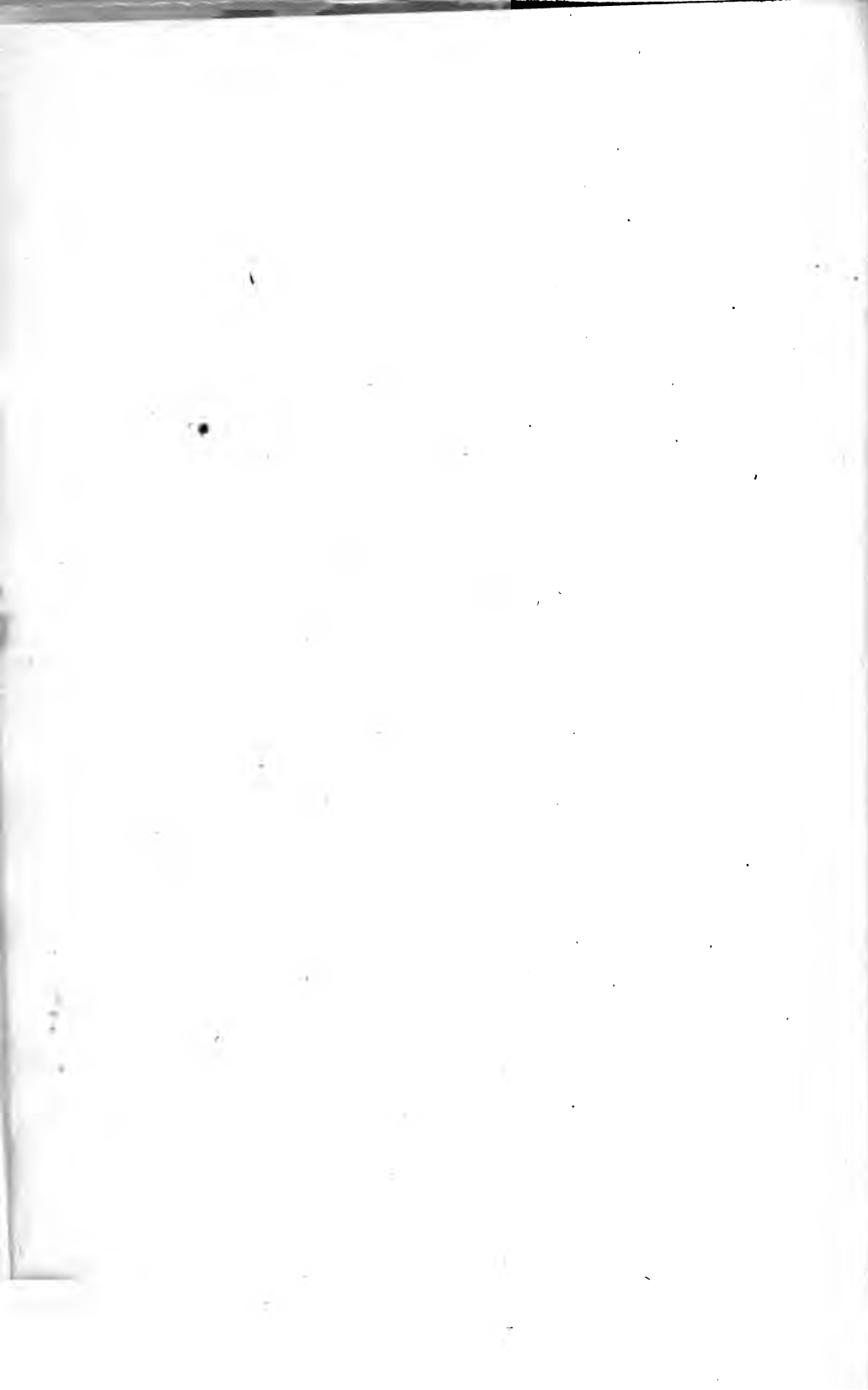


THE BEELZEBUB MONKEY.



ST. MICHAEL SLAYING THE DRAGON, AFTER RAPHAEL.

"Truth must triumph in the end, and the highest form of life must conquer."—See p. 16.



CHAPTER I.

HARMONY OF GEOGRAPHY AND ETHNOLOGY.

CENTRES OF CREATION—HARMONY BETWEEN THE QUALITIES OF MEN AND THE COUNTRIES THEY INHABIT: AS IN STEPPES, MOUNTAINS, FLOW OF RIVERS, DESERTS, TEMPERATURE—THREE GREAT RACES: MONGOLIANS, POLYNESIANS, AUSTRALIANS.

GEOGRAPHY and Ethnology harmonize; that is to say, the races chosen to inhabit particular regions of the earth, or who have been induced to settle there, and find a *true home*, possess not only qualities adapted to their climatic, zoological, and botanical surroundings, but are constituted in harmony therewith, so that the race is more or less the key to the locality. This appears most strongly marked in our consideration of the lower divisions of the human family, but more or less pervades all. Those races that are more cosmopolitan, in proportion as they are so, represent the world, or a narrow confined section of it when their qualities are of less universal application.

We do not mean to say that we can at every period of their history, and in every small nation, trace what is in harmony with the land they have occupied, or do occupy, but we think that the specialities of great races are in harmony with their true "Centres," by which we understand the countries especially allotted to different stems from the same root in the genealogical tree of man. The difficulties attending the complete course of our analogy between race and country are past, present, and future, by considering which we can alone discover the true "ethnic centres." Were the different regions of the earth apportioned to the different varieties of the human species? Were the various countries prepared for each previously to the settlement of the particular race there? Was the land at first prepared for man, and then man for the land? Had adaptability the second place to proclivity amongst ethnic forces? In a subject like this, general correspondence and harmony must more be looked for than those of minute details.

The Mountains, the Rivers, by their elevation, course, and direction, illustrate the character, history and migration of

racés; as do Deserts, Steppes, Llanos, and other physical features, national or racial character and habits.

The inhabitants of mountainous regions are usually considered to be distinguished by loftiness of spirit and love of freedom. Pure mountain air may have somewhat to do with cherishing this feeling, and scenery of a grand character, abounding in rugged precipices and deep defiles, may have somewhat to do with kindling into flame an enthusiasm which already exists. But it is an independent spirit which prompts a nation; it is a self-reliant spirit which leads it to these lofty regions, where loftiness may commune with "loftiness," and a towering spirit with "a towering height." The inhabitants of mountains may sometimes envy those of the valleys, where the sun shines so long, and in the days of prosperity descend to eat the fruit of the citron, the olive, or the vine; but adversity they feel to be more in harmony with the desolate crag.

"Away, ye gay landscapes, ye gardens of roses,
In you let the minions of luxury rove;
Restore me the rock, where the snow-flake reposes,
Though still they are sacred to freedom and love."

The inhabitants of Steppes are commonly wild, roving, and independent, and usually democratic rather than aristocratic, unlike mountaineers, whose tendency is to *look up to chiefs*, as to a mountain peak. The inhabitants of steppes acknowledge great chiefs, who are few in number compared with those whom mountaineers obey. This is the case with the inhabitants of the steppes of Asia, as with those of the pampas of South America, or the Llanos of Mexico and Peru; while low plains are generally inhabited by those who are more inclined to a democracy.

In flat countries lying at a low level, the inhabitants are mostly dull and heavy. They may be industrious, as in Holland, where the stimulus of the wants of an increasing population first led to the subjugation of the sea—a conflict which they have successfully maintained for centuries. They gaze on its "mountain billows," which are the only mountains they commonly behold, and which are ready, with an avalanche of foam, to take advantage of any defect in their "much-vaunted bulwarks," glory over any flaw in their outworks, and engulf in the seething German Ocean centuries of labour. Such conflict with the elements is a noble struggle for a nation, and the best antidote against "a dead level" in its society.

The Mountainous Systems of Europe are pregnant with interest, if we view them as illustrative, by their direction and elevation, of the course and power attained by nations. The most lofty and grand of the mountainous systems of Europe is the Alpine: it extends from Genoa to Vienna, from

the Pic des Ecrins to the Rhoetian Alps and the Tyrol. The Vorarlberg chain, extending through the Tyrol, Swabia, and Bavaria; the Carnac and Julian Alps; the Jura mountains, the Apennines, the Eastern Alps of Dalmatia and Croatia, and the Danubian principalities, Albania and Montenegro; the Alpine chain in Greece and the Morea; the Carpathian mountains of Hungary and North Germany,—all belong to “the Alpine system.” This so-called “alpine system,” or series of systems, which have been thus classified by Bruguière (see A. K. Johnston’s Atlas, plate 3), we think represents great empires and rulers raised as much above small states, or the populace, as these high peaks are elevated above low hills.

The highest mountains are in Savoy, which formerly belonged to Italy, to the land of the Cæsars, but now to France. Napoleon, in crossing the Alps from France to Italy, did but approach Cæsar’s throne. The Alps, by their height, represent Italian power. I shall endeavour to trace how far the mountainous chains in each country represent its dynasties and rulers.

The Gallo-Francian mountains, of which the highest is the Puy des Sancy, 6,220 feet high, is a truly French mountain, and illustrates by its altitude the power that monarchy attained in mediæval times. The various high peaks in Germany, the Tyrol, Hungary and Bohemia, as they tower among their fellows, typify “the mantle of Cæsar,” which for a time fell upon some fortunate prince of central Europe.

The chain of the Apennines splits Italy into two unequal parts, and is one of the great hindrances to its unification. Monte Corno, the highest mountain within the late Papal States, typifies the Pope’s position. He is the principal obstacle to progress in Italy. The Apennines have been called the “backbone of Italy;” and surely they have been “a bone of contention,” or line of separation, between north and south Italy.

Etna is the highest peak in the late kingdom of the two Sicilies. As a great volcano in a volcanic island, it may represent a population inclined to eruption; as Vesuvius in the neighbourhood of Naples does the disposition of the *lazzaroni*. A very large portion of southern Italy, and the whole of Sicily, is volcanic. The volcanic nature of this soil typifies chronic discontent, as an active volcano does a revolutionary centre, and an *eruption* an insurrection. Insurrections sometimes occasion incendiarism, and generally a great deal of dust, mud, and dirt are cast out and scattered with but little regard to persons or property. Revolutions proceed *from beneath*, and so do volcanoes; while enlightenment and moral progress, that descend from above, are typified by the light given by the heavenly bodies.

The Hesperian System of mountains includes the Pyrenees

and the mountains of Spain and Portugal ; it is a large system, the highest part of which is the Cerro de Mulahacen, in the province of Granada, which towers to the height of 11,663 feet ; a true representative of the Spanish monarchy, and of the lofty elevation it attained shortly after the conquest of Granada.

The mountains in Sardinia and Corsica have been formed into a distinct system. The population of these islands has much Punic blood ; but the hero of Corsica—Napoleon— was Italian rather than Corsican, and his views towered higher than any mountain in the little island of Corsica.

The Sarmatian System, or that of the mountains of Poland, is not an elevated chain, not rising above 1,100 feet ; a type of the kings of Poland, whose power never attained a height equal to that of the western kingdoms of Europe. These Polish mountains are low, compared with those of the Ural, which separate Asia from Europe ; and, if they represent the Russian Czar, clearly approach what belongs to Asia—a semi-Asiatic government.

The mountains of Scandinavia have been considered to form, with Lapland, a system which is denominated the "Scandinavian," the highest point being 8,500 feet. This elevation perhaps typifies the great Scandinavian princes, Gustavus Adolphus and Charles XII. of Sweden.

The Rivers of Europe and Asia flow in different directions towards oceans and seas, which may be taken to signify to a great extent the direction followed by human emigrants from the different countries. The largest portion of the rivers in Great Britain, Germany, and France, flow towards the Atlantic or the German Ocean, connected therewith. In harmony with this, the flow of population from these countries is mostly across the Atlantic.

The Rivers of France and Spain partly pour into the Mediterranean and partly into the Atlantic, and the "flow of population" is partly east and south, and partly west. The rivers of Greece and Italy all flow into the Mediterranean, and the flux of population is not mainly transatlantic. Still less is it of those countries whose rivers enter into the Black Sea, whose population do not to any great extent voyage further than the Mediterranean ; at least, not to settle.

The populations which live on the banks of those rivers which flow into the Caspian Sea, the Sea of Aral, and the Lake Baikal, which have no communication with the sea, are still more exclusive, reaching Europe on the ocean rarely, compared with the inhabitants of other continents. Vast rivers, such as the Lena, Yenesei, and Obi, pour into the Arctic Ocean, an ocean difficult of navigation. The population has little communication with

the sea, and does not much attempt navigation ; the inhabitants follow their rivers to the ocean, but do not go much farther.

Most of the rivers in Sweden flow into the Gulf of Bothnia, the Baltic, or the Atlantic Ocean, and very few into the Arctic Sea. The "flow of population" is towards Russia, Prussia, Germany, or Britain, rather than towards Spitzbergen, although a few rivers, running from Lapland towards that island, typify the summer visitors from Lapland or Archangel.

The rivers of India run in different directions—the Indus flows into the sea between India and Arabia, that portion of the Indian Ocean which receives the waters of the Persian Gulf. The population who follow the course of the Indus have more commerce with Persia and Arabia than the population who follow the Cauvery, the Godavery, and the Kisthna, into the Bay of Bengal. The mouths of these rivers are farther south, and the populations who follow their course settle in the Mauritius or other islands of the far south, or even in the Western hemisphere. The Ganges empties itself into the sea at the top of the Bay of Bengal, which situation points pretty nearly south, but its various mouths may take in many points of the compass, significant of the emigration of the Bengal coolies to so many lands. The truth of this remark is easily proved by taking a good map of Hindostan, and drawing straight lines on the sea in the direction of the different mouths ; this will be found to include many of the thirty-two points of the compass.

The rivers of China all point east, or south-east, or north-east. Chinese emigration follows in these directions—that is to say, to the islands of the China sea, of the Pacific, to Australia, and California and parts of South America, rather than towards the western portion of Asia, Africa, or Europe.

The commerce and trade of the Euphrates valley, except that overland, is with the eastern countries of Persia, India, and Oman principally, in accordance with the course of the river.

Nearly all the great rivers of America flow towards the east, which is significant of the direction their commerce takes, and which their population will take, should their land ever be saturated with that of the Old World ; or when Palestine becomes the political, as it already is the geographical, centre of the Old World. These great continents of America being fertile and peculiarly rich in vegetable life, and possessing few great deserts, like those of Africa or Asia, or the island of Australia, have large rivers, "vast bodies of water" which, flowing from the west, meet the waters which proceed from the east, from Africa and from Europe.

The sea is the medium of communication between the countries ; the productions of one flow down its rivers, and are

exchanged for those of the other. The larger size of American rivers points to active vegetation, and to the export on a large scale of the productions of the Vegetable Kingdom. The portions of America which yield the most valuable minerals are more deficient in inland navigation than those which yield timber and raw vegetable products. The abundance of water, although the one means of producing this fertility, yet has a further significance. THE METALS AND MINERALS ARE MEANT TO BE CONVEYED ON ROADS OF THEIR OWN MATERIAL.

From the rivers we turn to their source of supply, the rains. Rain is most unequally distributed over the earth's surface. In some parts no rain falls; in others an excess, to the casual observer. Rain may be taken as typical of all blessings descending from above, which are distributed in different measure. From the tropic of Cancer to the tropic of Capricorn, and somewhat beyond and below the first-named, in Asia and Africa, periodical rains fall, there being a rainy and a dry season somewhat distinctly marked. A tropical zone of "constant precipitation" extends from the 6th to the 9th degree of north latitude, which is, however, interrupted by the monsoons in the Indian Ocean. These periodical rains typify blessings and calamities which follow each other in somewhat regular sequence; while the regions subject to an irregular fall of rain receive less blessing at one time, but are not so frequently visited by heavy calamities: this is especially the case with Great Britain, which does not receive such great gifts in the way of abundant crops as some other countries, but whose crops are less liable to fail than any, principally because our rainfall is more regular as regards its annual amount.

Sunshine may be taken as the emblem of enlightening influence, while rain is that of resources come down from above, which the sun's light and heat enable the earth to use.

The earth is divisible into zones and districts more or less favoured. A rainless tract of land extends almost from the West Coast of Africa to beyond Irkutsk and lake Baikal. This region is desert except in the immediate vicinity of large rivers. It is somewhat broken in one or two instances by mountain chains, which STAND, LIKE THE PROPHETS OF OLD, WITH SNOWY HEADS TO INTERCEDE WITH THE ALMIGHTY FOR THE DESERT LAND.

These barren tracts consist greatly of plains or low hills. The rainless districts are types of countries under a curse. They are of pretty equal extent in Asia and Africa; but the greatest desert in the world is admitted to be the Sahara, the type of African backwardness, as regards civilization. It is

accompanied in some cases by great spiritual darkness and a desert of neglected duty. The Sahara skirts Algeria, Barbary, and Libya, countries which, from their belt of fertile coast-land, may be said to have enjoyed great advantages, as their populations, the Berbers, Moors, and Carthaginians, did. They turned their backs on many a conquered country, "and left it a desert:" they live with a desert at their back.

The land of Egypt is blessed with a great river, which carries to its delta alluvial mud, the foundation of the fertility of Egypt. Thus the overflow of the Nile has supplied the deficiency of the rain from heaven: such is a type of the civilization of Egypt, of an earthly character, compared with that of Palestine, which was so much more elevated morally. The country enjoyed much more of the "rain of Heaven." A great portion of Babylon and Persia is desert of this character: they enjoyed little spiritual enlightenment. The desert places in Persia, barren and desolate, are indicative of gross darkness; such accompanies the worship of Yezidis, and of the tribes who wander through Chinese Turkistan and Mongolia.

A great part of southern and central India has either no rain at all, as in Scinde, particularly at Kurrachee, or a small amount, such as 25 inches yearly, as at Beejapore. This alone without irrigation cannot induce fertility in a tropical climate. The bulk of India suffers from too little rain, and it is a country which above most others calls for irrigation. This deficiency of rain in some parts, and abundance of it in others, indicates various degrees of blessing, showered upon the different Nationalities in India.

The regions of most of the Republics of South America have the least rain on that continent, such as La Plata, Peru, part of Chili, a great part of Mexico, Guatemala and Venezuela, in which latter place the annual rainfall is 7.52 inches. This appears to be significant of little favour from heaven, these Republics being left to "their own wicked devices" in most cases. In former times, when they were European colonies, things were not very much better.

The Cape of Good Hope has not progressed in the same proportion as other British colonies, probably on account of the large amount of desert in the interior, and the but moderate rainfall. The tribes who inhabit southern Africa show analogy with their climate and soil. Thus the Bechuanas produce less, and are less valuable as servants, than Congo or Eboe Negroes; but live in a more moist and fertile country than do the Bosjesmen, who inhabit one of the driest tracts, and are about the least promising of the savage races of southern Africa. The Caffre population is more intelligent, but perhaps not equal to that of Madagascar, which enjoys more rain, as a whole, than the Cape.

The land of the Negro races on the West Coast of Africa, which includes the country of the Jollofs and other tribes of Negroid descent, extends from the 18th° of north to below the 15th° of south latitude. This region is rainy, and stretches far into the interior, if not quite across the continent. This land is clearly intended as a theatre, for great deeds, not perhaps in arts and manufactures, but in the production of raw produce. But nothing can be achieved without great help from without. The deserts of Sahara must be bridged over ere much can be done for the civilization of Africa.

Much more rain falls in general on high mountains than on plains. It may be said to fall on the mountains for the benefit of the valleys, down the sides of which it flows by a torrent or a stream. The torrent or the stream represents knowledge descending from a pure and lofty source, to fertilize and refresh the world below. The streams which irrigate the valleys and the plains represent highly-gifted tribes, who assist inferior nations so much in the development of their resources.

The Temperature of different regions of the world is almost as varied as the rainfall, and has less to do with latitude than is commonly supposed, particularly in the northern hemisphere. The isothermal lines more follow those of latitude in the southern hemisphere, in consequence of the small amount of land. It is likewise much colder on the same insular grounds in proportion to latitude. Heat of atmosphere clearly typifies, as has been often remarked, degree of passion and emotional power in nations and individuals. The Arabs of the centre of Arabia, and the inhabitants of a considerable portion of Abyssinia, are commonly considered as amongst the most "fiery tempered" people on the globe. They are the reverse in this respect of the Teutonic tribes, who form so large a part of the inhabitants of the British Isles. The Arabs of Central Arabia, although living in the isothermal of July, 90° Fahr., with the inhabitants of Nubia, are more fiery than they. The Arabs belong to a purer division of the SEMITIC-EUROPEAN race than do the Nubians, who are largely mixed with the oven-dried, swarthy Hamites. It is possible for nations to be rendered less fiery by long residence in a hot climate.

"One fire burns out another's burning."

A moderate amount of baking renders food more pungent, but too long contact with excessive heat serves to destroy flavour, and reduce the whole to an inert mass. These divers effects of heat are also observed on nations.

An isothermal of 86° Fahr. in the month of July passes

Calcutta, Delhi, and Bagdad, through a great part of the Desert of Sahara, and on the confines of Egypt, and another line of 81° Fahr. passes through Borneo, Sumatra, Bokhara, Algeria, Morocco, Madras, Bombay, and a great part of Negroland. These two last lines include a great portion of the tropics. They indicate a great degree of heat, and typify "a hot-blooded population," such as that of Bokhara, Bagdad, Syria, Algeria, and Morocco, of the country of the Joloffs, of Bombay, of Madras, and India generally. These populations have all less self-control than those of Europe taken collectively, and are more inclined to fanaticism, and to be led by their feelings rather than by their intellect.

The West Indies, from the Antilles to the extreme north of South America, to the vicinity of New Orleans, and a great part of the southern states of North America, Yucatan, and Panama, possess a population excitable and more led by passion than that of Europe, but less perhaps than that of some of the hotter regions of the earth. An isothermal of 72° Fahr. in July may be drawn from California to New York, the Canary Islands, Madrid, the south of France, and the north of Italy. Here a population is found somewhat "warm-blooded," and "sudden and quick in quarrel," which becomes less conspicuous within the lines of equal July temperature as we advance north, until we reach the isothermal of 59° Fahr., which is that of the British Isles, Canada, Scandinavia, and Archangel.

The Irish form one of the few exceptions to what we have just stated, which must not, however, be understood to mean that the climate is the cause of this, but that the heat of the climate generally typifies as it accompanies the "heat of blood." The warmth and excitability of the Irish are probably occasioned by the vigorous "stirring up" they have received, which, amongst men as amongst liquids, increases heat. As in chemistry the mixture of two or more substances occasions heat during the process, so amongst human races the greatest amount of excitement follows the union of tribes, whose infusion acts like the addition of fermenting agents. The Irish, if descended from Milesius, would be of Oriental origin, and Asia Minor, from which they were believed to have come, has a particularly fiery climate in summer.

The further north we go, allowing for other influencing elements, the cooler it becomes, and the cooler is the population within certain limits until the frigid zone is reached, where the population is remarkably cold with regard to human feelings and sympathies; but the passions are not always so much under the control of the moral faculties as in more

temperate regions, where it would appear volcanoes are more common than in the north temperate zone, especially of Europe. The greatest power of feeling is occasionally concealed under a cool exterior. Hecla, one of the largest volcanoes in the world, is surrounded by a frozen crust.

Blumenbach, studying man physically and zoologically, divided him into five races, which he termed the Caucasian, Ethiopian, Mongolian, American, and Malay, or Polynesian. Yet these two last but one have clearly almost as much affinity with the Caucasian, Ethiopian, and Mongolian, or crosses between them, as have Gallas or Abyssinians with Scandinavians or Englishmen; or, again, as contrasted with Piedmontese, who are yet all classed as "Caucasians."

The term "Caucasian" is extremely unsatisfactory, and should be for ever dissociated with the range of the Caucasus, when applied to the great "CAUCASIAN RACE." The inhabitants of the Caucasus are clearly a branch of the *Turkish race*, an intermediate type between the SEMITIC-EUROPEAN and the Mongolian.

We use this expression, "Semitic-European," to designate the Hebrew, Syrian, Arab, and other Abrahamic tribes, and all other descendants of Shem and the Georgian race, together with the inhabitants of Europe generally, with the exception of the Finnic and Laplandish races.

Blumenbach's classification is especially unsatisfactory with regard to his American race, for the Araucans of South America differ as much from the Aztecs, or the "six nations" of North America, as do the Kalmucks from the Malays, and the different tribes of Negroes, termed Ethiopian, from one another. The Kalmucks, Esquimaux, and Chinese also greatly differ.

Whether we accept the theory of races, intermediate in character and physical appearance, between two widely-separated races, as a *hybrid* between them, or consider their qualities as inherited from ancestors equally marked, still physical resemblance, as a whole, points to filiation more or less remote. Such appears to connect these American and Polynesian divisions with the Ethiopian, Mongolian, and Caucasian; but mainly, perhaps, with the Mongolian. This division into THREE GRAND RACES appears in harmony with the nature of man. Difficulties attend every view of the subject, but this appears to present the fewest.

The form of skull is very generally taken by ethnologists as an index of race or the character of races; and advisedly, for certain forms of skulls always accompany given bodily shapes. If we divide mankind into three great races, we recognize in the

typical skulls characteristics as follows : In the Caucasian a well-proportioned oval skull, cheek-bones or zygoma of moderate height, and the chin well developed. The Negro form of skull is termed "prognathous," on account of the prominence of the jaws, which causes the whole muzzle to project. The head is long and narrow, and mainly developed at the base of the brain, and sometimes approaches the shape of a wedge. The Mongolian form of skull has been termed by Prichard the "pyramidal;" it is remarkable for the width of the zygoma or cheek-bones, which are frequently wider than any other part of the skull. It is often square or broad, but not apparently very large, yet of great cubic capacity, greater than that of many a skull which would look larger to the external eye. The hair is black, very coarse, and straight; the body is squat and of short stature, but long in proportion to the legs.

We shall now review the Mongolic division at greater length. It is the division of mankind most inclined to deceit, intrigue, and insincerity, but has much mechanical talent, so far as the "cunning" use of tools is concerned. The Chinese, the typical Mongoles, Kalmucks, Samoeids, Tunguses, Laps, Koreans, and Kamschatkadals represent the purer divisions of this race; while the Siamese, Burmese, Turks, Fins, and Magyars represent *mixed races*, or at least "intermediate types" between the Mongolic and Semitic-European. These may be called mainly of the Mongolic race, and the first-named list especially are greatly of the Mongolic type; but the Malays form an allied type, which, although created with special peculiarities, yet doubtless sprung from the same source as the true Mongoles.

The Malay race, with its subdivisions, possesses the high cheek-bones of the Mongolic. The head rises to a great height on the crown, but is not high at the centre, and somewhat low in the sinciput region. The teeth project like those of the Negro; the face is broad, somewhat flat, and certainly not angular. The frontal sinus is large and prominent. The men have very little beard. They average five feet two inches, and the women four feet eleven inches in height. The skin varies from sooty olive to bright brown or yellow. This absence of beard and presence of high cheek-bones proves them to be mainly "Mongolic" in their affinities; while the prominence of the lower jaw points to a connexion with the Ethiopian race. The Malay has some of the understanding and inventive talent appertaining to the Semitic-European race, without its steadiness and sense of justice and of the rights of humanity. The Malay character is a cruel, vindictive, and savage one. He cruelly tortures himself for the sake of distorting his person by

the tattooing process, and other devices are practised by him by which the human frame is marred. He files his teeth and enlarges the lobes of his ears. He is guilty of cannibalism, and preserves the heads of his foes as trophies. He is devoted to the sea, and is, for a savage, a skilful navigator. His subdivision, the Polynesian, possesses the most ingenious fishing tackle in the world. The Malay proas are among the fastest sailers and the most smooth-going craft afloat: another argument for the great mechanical skill possessed by the race.

The three great human races may be characterized thus: the Semitic-European, or the moral, intellectual, and theological race; the Ethiopian, sensual, servile, uninventive, but strongly domestic; and the Mongolic, mechanical, deceitful, hard-working, avaricious, but with weak domestic propensities, and the least to be relied on of the three.

The aboriginal inhabitants of the continents of America possess skulls which more approach those of the Mongolian race than they do the Semitic-European or Ethiopian. Their physical aspect shows analogy to the different Mongolic races of Asia.

The Thibetian race inhabit Thibet, Ladakh, Bootan, and little Thibet. The religion is variously Buddhist, Brahmin, and Mohammedan. The language is monosyllabic. These regions are all more or less elevated, Thibet in particular. It is under the dominion of China. Its elevated situation in the neighbourhood of a great mountain chain, the tops of which are crowned by perpetual snow, gives to it a rigorous climate, notwithstanding its situation from the 27th° to the 32nd° of north latitude, which is inclusive of all those before-named countries possessing a Thibetian population. The inhabitants of high lands are more commonly enthusiastic in their religion than those of low lands. The theology of the latter is more generally of a material and less complicated character; allowance of course will have to be made for difference of race and other circumstances. Thibet is a land of priests and temples, devoted to the Buddhist worship, to the adherents of which it is a sacred land; a land calculated, from its geographical situation and elevation, to look down, as it were, on China and India on both sides of the Ganges. The inhabitants are pastoral in what is temporal as well as in what is religious, and very suitably have a fine race of dogs renowned throughout the East for their size and strength. The grunting ox or yak is one of their chief animals; it is allied both to the sheep and the ox, and may be a type of a nation whose religion occupies a place between Brahminism and Mohammedanism. The musk-deer is one of the principal objects of pursuit in that country. Its odorous

pouch is collected with the utmost care, and its perfume is the most pungent of the odours of the East. Like Buddhism, it scents the whole East, and most strongly too, stronger than the sandal-wood typifying Brahminism, or the spicy fragrance of Mohammedan incense. Buddhism is more extensively practised than any other religion on the globe, and Thibet is its centre.

The Chinese race is a more nervous division of the Mongolic race than those which inhabit countries farther north. They have less physical force, but are more civilized, and have more intellectual activity than either Tartars or Kalmucks. They have made considerable progress in arts and letters, but their mechanical use of them, their not being able to comprehend the principles on which they are founded, leads to the belief that they were in early ages influenced by Semitic-European nations, possessing higher qualities, who were unable to teach them more than the "mechanical performance" of science and art, which must have been brought to their present comparatively high state of perfection by progressive steps, which would involve *progressive minds*. Such the Chinese do not possess.

"China proper" is a vast country, elevated in the north with large fertile tracts of table land; in the central regions watered by the Hoang-ho and Yang-tze-kiang. High mountains and lakes abound. The climate of China is hotter and colder than Europe is in the same parallels. This extreme of heat and cold may typify a cruel and at the same time a cowardly people. There are no active volcanoes in China, significant of a mild and tractable population, amongst whom revolutions are rare, and generally proceed from the decay or rottenness of the government, which allows decomposing matter to accumulate until a hotbed eventually produces spontaneous combustion.

China is a land of gardens and flowers. Here the most gorgeous shrubs grow to the size of the forest trees of Europe, and gardening has been pursued for centuries in accordance with a systematic design. The colouring of their houses and manufactured articles is pure and bright, like flowers, like birds, like insects, and not like the subdued hues of a landscape, such as the *ateliers* of Europe emulate. Chinese colouring is inspired by the natural objects in China and by the Chinese sky. The people have pretty accurate notions of colour, and some skill in combination, but their perspective is influenced by their wrong ideas of the comparative relation or importance of objects to each other. This view, in the first instance, led their teachers to imitate in a distorted manner the proportion of objects. These grotesque models were probably introduced in an age which would be considered "rude," when viewed in relation to modern civilized life.

The Mongolic mind, apt to dwell on what is monstrous and fantastic in nature, or in ideas of nature, is exemplified in the arts of China, which give "a bird's-eye view" of its inner life. Elegance of design is less understood by them than elaboration. Their sublimest arts are porcelain and *papier mâché*, or disproportionate carvings in wood, jade, or ivory, tessellated enamels on copper, or a fantastical roof or trellis-work; but of simple grandeur or pure taste in form they have not the least idea or appreciation. Their tastes are artificial rather than natural, and grotesque rather than artistic. They exhaust ingenuity in carving ivory balls within each other, and yet want the power of making a watch which can perform accurate time. Notwithstanding their love of what is exhaustive of useless ingenuity, the Chinese are generally a shrewd and economical people, who carry the management of resources to a point far beyond that of any other nation, ancient or modern. This is particularly true of the poorer classes, who may be the most practically wise, while the rich spend their means lavishly in the encouragement of the arts and manufactures for which China is so famous in the western world. A Chinaman is the shrewdest bargainer in the world, so far as shortsighted shrewdness goes, and the most indefatigable collector of rags, bones, and bottles, or feculent matter, which latter is with him an affair of dire necessity, as the sole means of supporting an exhausted soil. The cultivation of each plot of ground, even on the high mountain ranges, is practised in accordance with a strict sumptuary law. Such a law, however, argues uncommon thrift and industry in the race, urged forward perhaps by necessity. The soil of China yields to this resolute pressure abundant crops, but scarcely sufficient for the somewhat over-populated country. The Chinese, unlike the scrupulous Brahmins or Mohammedans (we of course except those of these persuasions residing in China), are almost as omnivorous as their own swine, to whom they show some approximation in expression of countenance. They appear to have availed themselves of the permission given to Noah, "Every moving thing that liveth shall be meat for you; even as the green herb have I given you all things" (Gen. ix. 3). These omnivorous tastes are accountable for the disappearance of most animals in China, mammals as well as serpents. The balance in nature is destroyed, which may perhaps have somewhat to do with the extreme unhealthiness of the climate of China; for the different classes of animals not merely serve to keep one another in check, but to render the air more pure.

The climate of many parts of China, among the most unhealthy in the world, is greatly caused, doubtless, by the heat

of the sun, which occasions the rapid decomposition of organic substances, which in the dry season cannot so readily enter into new combinations (that is to say, form part of the bodies of animals or higher vegetables); and thus the air is poisoned by the presence of recently-decomposed elements from dead animals and plants. This is not so much the case in the less highly-furnished southern hemisphere. Most Europeans who remain long in China return home with broken constitutions. Many of the Europeans lose their nice sense of honour by a long residence in China, the unhealthy moral atmosphere affecting a great many persons more or less.

The Chinese live much in the past, and magnify greatly their ancient history, traditions, customs, and ancestors. The Chinese object to the use of milk, and have little of the "milk of human kindness." They are a lively, gay people, who have little regard for human life. This would be in harmony with an unhealthy region.

The races who inhabit India beyond the Ganges, resemble the Chinese in some respects; they are intermediate between them and the Semitic-Europeans, at least in physical appearance. They are more good-natured than the Chinese, but have much of their avaricious and cunning character. The country is less densely peopled, and the population is less civilized, and has not been able to extirpate the larger animals so nearly as the Chinese, who have eaten up almost all the animal life of their land; and have turned all their flesh into human flesh. This they now support on a vegetarian diet; hence they may be said to vegetate.

The Indo-Chinese races are sensual and gluttonous; their arts and sciences are behind those of either India or China. They still have the tiger, the elephant, and the rhinoceros in great abundance: in this the country resembles Hindostan. The Anamese, Siamese, Kambojians, "the Mon," and the Burmese, possess monosyllabic languages or dialects, and the Buddhist religion.

The soil of Burmah is highly fertile, and much rain falls. It is one of the most unhealthy countries in the world for Europeans, but is rich in minerals as well as in animals and plants. It is an unprofitable province to the British; a grave to her soldiers, and equally a grave to her rupees. These great advantages and disadvantages connected with the country, are somewhat typical of the nation; they possess many excellent and useful qualities, but are withal somewhat treacherous, in common with the whole Mongolic race.

The Samoieds wander on the shores of the Arctic ocean, from the river Petchora to the Yenesei, and further south on the Altai

mountains. They are a barbarous people, given to demon worship,—“Shamanism.” They occupy themselves with fishing, hunting, and soothsaying.

The Ostiaks are a fishing tribe, and are also of the Shaman religion, which is the most general faith among the northern inhabitants of Siberia. They are stunted in growth, like the vegetation of their land, by the intense cold. The Laps of Europe, and a portion of the Ostiaks, profess Christianity; but it is Christianity in a very rudimentary, carnal, and material state. Although sincere in their belief, their narrow moral capacity does not admit of their entering into its sublimer truths, or even into the less spiritual faiths of Islam and Buddha.

The Fins of Russia are a refined division of the Mongolian race, and have been considerably mixed with the Scandinavians in Sweden. The physical form of many of the Swedes evidences this. The Fins are mostly under Russian influence: they have much energy, extraordinary obstinacy, and imperturbable gravity. The country is flat and marshy, the soil is fertile, but the summers are too short to ripen southern fruits, or even wheat. Barley and rye, however, flourish, as well as the potato. This food typifies the imperfect manner in which they receive Christianity, and their inferior tone of morality as contrasted with the Scandinavians. The Fins live much on fish, and are dirty in habits and strong-smelling in person. They are a race which approaches in many of its characteristics both the Semitic-European and Mongolian; and their geographical position is intermediate between the Teutons on the one hand, and the Laps and the Samoieds on the other.

Nations who live on fish are more degraded than those who live on the flesh of wild animals; while those who live on wild animals are less elevated than those who live on the flesh of domestic animals and cereals. SAVAGE OR WILD FOOD, IS FIT FOR SAVAGES.

The Magyars, who at present inhabit Hungary, have been assigned an origin similar to that of the Ostiaks of arctic Russia. They clearly do not represent that race at present, being so different in appearance. The Ostiaks are a feeble race (according to Pallas) of little capacity, while even the Magyar section of the natives of Hungary possess great latent power under a cool exterior. About the mass of the Hungarian population there is considerable mental lethargy, and a disinclination to initiate improvements, which has neutralized to a great extent the extraordinary advantages of geographical position, fertility of soil, and mineral wealth, which might have enabled them to dictate to, and rule over, central Europe. The natural wealth of Hungary has not been in the hands of a population capable

of turning it to the fullest account. The Hungarians are, nevertheless, a fine people, and have been I think most unfairly classed with the Mongolic race, with whom in moral character and physical appearance, they have little in common. They are not an obstinate race who improve slowly like the Fins and the Laps, but are a superior race capable of great and rapid improvement. The Magyar, like his country, possesses great powers of culture, and is capable of astonishing the world by his mental, as his land can by its vegetable and mineral productions. Like his rich soil, he only requires "to be stirred up" to produce transcendent fruit. His land might feed a third of Europe, as well as make it drunk with the strongest wines, in return for manufactured goods from western Europe. The soil is not *hungry*, the population is not *hungry*, EXCEPT FOR CONSTITUTIONAL GOVERNMENT.

The Turks of Europe were originally a Mongolic race of nomad habits; residing in Mongolia, from the Altai mountains to the great wall of China. The Kirghis are believed to be a division of the Turks; they are mainly Mongolic, but approach the Semitic-Europeans in being bearded, which is more strongly marked in the Osmanli Turks who have intermarried somewhat with the inhabitants of the Caucasus, and show great approximation in facial angle at least, to the European type. The skull still maintains the Mongolic shortness, but the race has increased in height. The European Turks possess but a moderate share of intellect, and even that has been very little developed. They have less mechanical skill than other European nations, or power of understanding first principles. Their obstinacy and self-conceit greatly hinder their advancement in knowledge and the arts. They have strict notions of honour, to which they adhere more frequently than do most nations of the East. For commerce and arts they have less aptitude than either Arabs, Chinese or Greeks.

Pride, courage, the influence of geographical position and the balance of power, have alone given them a place, and maintained it, among European nations so superior to themselves intellectually as Greeks or Albanians are, yet inferior morally, although they profess belief in a religion more favourable than Mohammedanism for the development of morals.

Much of the soil in Turkey is extremely fertile; the surface is subject to undulations, and mountain chains traverse it; but not of great height. They may typify the present elevation of the Turkish empire, which the snows of Ararat by their superior height represent "in bygone days." Ararat stretches as far above the mountains of western Asia, as the Turkish empire formerly did above its present height. The Turks have,

properly speaking, no place in Europe; their "ethnic centre" is in Mongolia; they do not therefore harmonize with the geographical peculiarities of their present habitat. The wild boars of the land and its wine they may not touch. The country is more agricultural than manufacturing, in common with most countries which do not produce coal. Our last remark applies to European Turkey.

The Mongols who have been accepted as a type of the Mongolic race; as one of the most marked tribes of the family, are not probably the purest of all. The physical characteristics of this race are a broad, flat face, particularly at the nostrils and cheek-bones, with a forehead narrow on the sinciput, so that the visage is almost triangular, from the cheek-bones to the chin, and of the shape of a lozenge when the whole full face is viewed together. Their legs are feeble and crooked inwards; being formed seemingly to fit the saddle. Their hair is black and coarse.

The Polynesians and inhabitants of the Indian archipelago appear to consist at least of two races. Some ethnologists, as Mr. Prichard, in his "Physical History of Man," think of three races, namely first, the Alfora race, consisting of the inhabitants of New Guinea and the Philippines; secondly the Pelagian or Papuan Negroes; and thirdly the Malays. The Alforians are most likely a branch of the Malay family: their hair is sometimes curly, and approaches that of the Papuan Negro.

The natives of New Holland are deficient in the mechanical skill possessed by Malay races generally; they have not the strong domestic affections so general amongst the Negro tribes. They are feeble as a race, and are fast dying out. They appear almost incapable of even an approach to civilized habits, and have as few of the qualities common to man, that elevate him above the brute, as any race on earth. No portion of the world so large as Australia is inhabited by so depraved a race; not one of this size contains so much desert land in proportion to its extent. It contains the most debased fauna of any country in the world, and is destitute of large carnivora and birds of prey.

New Zealand possesses a very extraordinary fauna; it is almost destitute of indigenous quadrupeds and reptiles, only a few birds remain. The Moa, the grandest of its class has passed away, the type of the former vigour and strength of the Maories. The Apteryx passing away represents their present state, it will soon be extinct; like them its haunts to be occupied by the rooting pig of Europe. The discovery of the precious treasures of the earth by European settlers is significant and emblematic of the future of these islands, and of the high

rank they will take in the history of the Southern Hemisphere.

Papua, or New Guinea, receives its last name from a supposed resemblance to Guinea in Africa. It is likewise inhabited by a woolly haired race, and is a rich tropical country, the metropolis of the birds of paradise. It abounds in the marsupial race of quadrupeds. The inhabitants are mostly a degraded race of cannibals: if Australia is in many respects analogous to Southern Africa, New Guinea is analogous to Equatorial Africa. The inhabitants are varied. The so-called Alfora race, the Pelagian or Papuan Negroes, and a race intermediate between these two, inhabit this little known island, which is one of the largest in the world. It is by some supposed to be the "Ethnic centre" of the Pelagian Negro.

CHAPTER II.

HARMONY OF GEOGRAPHY AND ETHNOLOGY—*Continued.*

RACES OF THE OLD AND NEW WORLD CONTRASTED—AMERICAN AND AFRICAN
 RACES CONSIDERED IN DETAIL—ETHNOLOGY OF BLUMENBACH—THAT OF
 EUROPE—THE BRITISH ISLES, AND THEIR FAUNA, FLORA, AND MINERALS—
 FAUNA AND FLORA OF EUROPE—MESOPOTAMIA—CAUCASUS—INDIA.

THE human races inhabiting America present a great analogy with those of the Old continent. In the arctic regions of both hemispheres, there are races which greatly answer to each other. In the old we have the Laps; and their analogues, the Esquimaux in America, nations of similar habits, morals and contour. The Fins, a xanthous race, are found in the East, and the natives of the Aleutian islands; Chenooks and other light-skinned tribes in the West. Skulls have even been found in Germany of supposed Fins resembling those of the Chenooks.

The Mongols, Tartars, Tunguses and other wandering tribes present some analogy to such nomad tribes of North America as the "Six Nations," but are a finer race: in fact the races of the Eastern are generally greatly superior to those of the Western hemisphere. The Mexicans remind us of the Japanese in their high state of culture; while the natives of Yucatan, further south, answer to the Chinese. In the natives of the more tropical Peru, we find some analogy to those of India. The cannibal Caribs remind us of the Malay race; both are devoted to the sea and are skilful in the management of the canoe. The docile natives of Hayti and the West India islands, showed much of the slavish and submissive dispositions of the Negro. We in vain look for any analogy between the aborigines of America and the higher branches of the Semitic-European race. This correspondence between the races of the Eastern and Western Hemispheres, is mostly with the Mongolic division, and is a great argument for the common origin of these races, but in the above superficial view of the subject, we would call attention to an *analogy*, not a common derivation.

We have said that the animals and plants of America, are less vigorous than those of the Eastern Hemisphere, in harmony

with the comparative inferiority of its human population. The Western Hemisphere is more the land of vegetables than animals. That is to say the relative proportion of large animals to large plants is much in favour of the plants: the exact converse of what prevails in the Eastern Hemisphere, and especially in Africa. America is more a land of timber trees than the Eastern Hemisphere, which produces more choice fruit trees, but fewer trees abounding in rich foliage.

Let us contrast the animals, as we have already done the Human races inhabiting the two hemispheres. The four-handed animals placed next in some systems of zoological classification to man, are smaller and less powerful in the New, than in the Old world. The lions of Asia and Africa, are giants compared with the puma of South America; as the tigers of Bengal are to the jaguar. As the great bats of Madagascar and India are to those of America; although the bats of America are in more ill repute for their thirst for blood than those of the East. The camel is greater than the lama of the west; the elephant than the tapir; the African buffalo than the buffaloes of North America; and the Marsupialia of Australia are larger than those of America.

The crocodiles of Africa are larger than the alligators of South America. The poisonous serpents of the Old world are more venomous than those of the New. The birds of the Old world exceed in size or ferocity those of the New. The *Rhea Americana* is small compared to the ostrich, as the turkey is to the larger bustard. The *lammergöyer* of the East is superior in courage, although inferior in size to the condor of the West. The pigeons of America are smaller than those of the East, but the Macaws of America, far surpass in size the Eastern members of the parrot family. This last is one of the comparatively few exceptions. America is however more a land of birds than the East, as it is of insects. But yet *large* insects are as well represented in the East as in the West; the most energetic families of insects especially; namely the beetles and the Orthoptera, which class includes the locusts and "the walking-leaves;" they are larger in Africa, and do more mischief than in the Western half of the World. The *Chama gigas*, or giant clam of the Eastern seas, is larger than any shell of the West. The *Rafflesia* whose flower measures two feet wide, exceeds the dimensions of that of any American plant, as the Jaca fruit does those of any American fruit, if we except the pumpkin, which attained its monstrous size, first in the gardens of "Brother Jonathan," who himself belongs to a race of the Old World.

The inhabitants of America possess qualities which even more harmonize with the geographical features of the country

than do those of the Eastern hemisphere, which is generally milder, cooler, but less intensely cold than is the Eastern in similar parallels; but is at the same time wetter. It enjoys a great variety of climate, arctic, temperate and tropical. The fauna and the flora, are less vigorous on the whole than in the Eastern hemisphere.

Arctic America is most probably bounded by the frozen ocean; but the limits of Greenland, one of its more northern divisions have not been ascertained. The interior which has been little explored, is believed to be one vast field of perennial ice. Snow is there found in every month of the year but July. Vegetation is scanty; the birch, the alder and the willow, with a few green vegetables, potatoes and corn, are the principal products. Igneous rocks abound. This inhospitable country is inhabited by a very few Esquimaux, of short stature, corpulent bodies, and small intellects. This mental poverty is illustrated by the poverty of the soil. The Greenlanders produce little, as does their country. They live on fish like seals, whose products form one of the principal exports of Greenland. The few Danish inhabitants may be almost reckoned as strangers there, and clearly belong to another "Ethnic Centre." The country of the Esquimaux extends along the shores of arctic America. The few trees and shrubs of Greenland that line the southernmost coast, which in summer appear "green spots in a desert" of ice, may be types of the few examples of the Scandinavian race living there, and especially of the missionaries. Arctic America possesses many trees, but the vegetables mostly belong to the Cryptogamia, excepting a few saxifrages and other flowering herbs. As the vegetation becomes more arboreal, as we recede from the North pole, the population becomes more intelligent, until the temperate regions are reached, when the vegetation assumes an evergreen character, at the latitude of 40° north of the Equator. This is the region where the tribes are most energetic, and is nearly parallel with the portions of Asia, whose population presents some analogy with that of America, living nearly in the same latitude.

America does not possess any aboriginal race, fitted like the Semitic-European to subdue a sterile soil, to extract bread from stones: or a race like the Mongolian family in the East, who appreciate property sufficiently to work steadily for it. The semi-arctic regions of North America, over which the Beaver, Copper, Strongbow and Athapaskan roam, is scarcely a country much adapted to the growth of cereal grains, if not quite beyond their polar limit. These tribes of Indians are little inclined to cultivate the ground, and were perhaps therefore allotted a country incapable of producing the superior grains.

As we descend further south to the latitude of the great lakes, we attain a country generally well watered, and possessing a soil frequently fertile. The winter throughout this region is arctic, while the summer is tropical. The climate is more healthy than that 10° farther south, and is equally favourable for the maintenance of energy in red and white men.

Mexico is generally admitted to be one of the most fertile divisions of the North American continent. Few countries indeed possess equal natural resources, mineral, zoological and botanical; but the climate is particularly unhealthy for Europeans. This unhealthiness corresponds with the morals of the population. An unhealthy tone of morals generally accompanies an unhealthy climate.

Mexico is more than ordinarily volcanic. Volcanic regions of the Earth, unless where very thinly peopled, are more subject to political revolutions than other countries. This is especially the case in Europe and America. Volcanic eruptions, hurricanes or earthquakes are less frequent in the neighbourhood of orderly, moral and civilized Protestant populations, than in the neighbourhood of Pagan nations as Japan and the islands of the Indian archipelago; or in debased Catholic countries, such as Portugal, Southern Italy, the republics of South America, or the immoral populations of our own tropical colonies.

Mexico has not been visited by quite so many physical calamities, such as earthquakes, as some other regions, the inhabitants of which are equally immoral. It has been dealt with in a different way; for the populations have been for a long time allowed to cut one another's throats. Mexico contains much elevated land, the plateau of Anahuac being 1,500 or 1,600 miles long. Numerous high mountains, among the highest on the northern continent of America are found there. Mexico itself is an elevated city, one of the most so in the world, being 7,471 feet above the level of the sea. This lofty height is emblematic of the wealth and power in civilization, to which the Mexicans had attained previously to their conquest by Cortez in 1521; and of the intellectual superiority of the Mexicans, as contrasted with the other tribes of North America. They cultivated the ground diligently, and practised mining, metallurgy and the setting of stones, and had attained to great skill in goldsmith's work. Their public buildings might be compared with those of Egypt, with the inhabitants of which they had some analogy; and possibly might be descended with them from a Hamite source. Their character reminds us of that of the Tyrians or Carthaginians, which was cruel and vindictive, notwithstanding an elaborate style of living. They had made much progress in science, were acquainted with the solar year,

and had a system of hieroglyphics to represent ideas like those of Egypt.

With some cleverness and intelligence, the Mexican race have a low standard of morality, and are not much credit to the Christianity they now profess. Their national character and condition is well illustrated in the animals of the country. The puma may represent the Mexicans before the Spanish conquest; and the jaguar after it. The grisly bear may represent the European settler in California. The tapir may represent the aboriginal working population, less effective than that of the tropical regions of the old world. The birds so largely used in feather-work, for which the country was so celebrated; by their gorgeousness of plumage, and exquisiteness of texture, typify the grace, the polish and natural elegance of the population.

The Peruvians were a very superior people at the time of the arrival of the Spaniards. They are a mild intellectual race skilled in science and arts, who recorded time by the aid of knotted cords:—most races do not mark time even with this measure of accuracy.

Their language was marked by many inflections; it was polished and elegant, and suited to the poetry and oratory they so much cultivated. Their religion was an elevated form of paganism, reminding us of the more spiritual systems of the East. They abstained from human sacrifices, unlike the Mexicans. They inhabited mainly an elevated, healthy region. The coast of Peru is the reverse. There is much sterile land in Peru, as well as much that is fertile; which may illustrate the good qualities and defects of the race. The country possesses great natural resources, which like those of the people are not developed to the utmost. The principal exports of Peru are gold, silver, quicksilver and cinchona; and more lately nitrate of soda and guano. Its rich copper ores are among the most valuable on the globe.

Mexico is the most prolific in natural resources of any part of North America, but has a population debased when contrasted with that of European countries, though still greatly superior intellectually to the other aboriginal races of North America. The Peruvian race occupies a similar place in South America to the Aztec in North America. No country of South America of equal extent is richer, but the empire of Brazil, by its greater extent, has attained to a higher position.

Peru is the manure heap of the World, from which less favoured nations fertilize their soil. Wiser nations consume their own fecula, and as much as they can get of the produce of other countries.

The Incas of Peru imagined themselves descended from the

sun, in which they remind us of the Rajpoots of Hindostan. They did not consider the sun the Creator, but the greatest of the works of "Pachacama," the Invisible Spirit whom they worshipped. This may be compared with the Worship of Zend.

The Quichuas or Peruvians, are short in stature and square shouldered, with broad chests. The men average only 5 feet 3 inches high according to D'Orbigny. This great size of chest is certainly adapted to a population inhabiting plateaux of from 7,500, to 15,000 feet above the level of the sea; for in these elevated regions the lungs are highly charged with blood, and consequently distended, and necessarily require a large capacity for their expansion.

The Araucans and Pesherais of Chili, and Terra del Fuego, are a warlike, indomitable race. D'Orbigny says they possess large wide heads, high cheek-bones, thick lips and short flattened noses; but the eyes are horizontal. Their complexions and hair, remind us greatly of the Mongolic divisions; particularly of the Malay subdivision, or the Kalmuck. The Patagonians are the tallest aboriginal race on the American continent, and are one of the very tallest races on the globe; even though we allow that their height has been much exaggerated by the earlier voyagers; yet they surely vastly exceed in stature, other tribes of South America. They have their analogues in the taller Polynesians, who inhabit temperate regions such as New Zealand. Temperate climates are more generally inhabited by tall races, than either arctic or torrid latitudes.

The Patagonians are described as sullen, fierce and unamiable; as greatly deficient in moral dignity; and are usually considered little capable of improvement. They have extraordinary powers of imitation, and show considerable talent for picking up languages. This facility in copying if applied to a superior race, might afford a hope for the ultimate amelioration of their condition; for at present they are one of the least promising of races as regards usefulness.

Some of our most cruel and worst characters approach the Patagonian type. They have a low forehead, black, lank hair, high cheek-bones, tall fleshy bodies, impassive, unfeeling, unintelligent mouths and eyes. This is the bilious lymphatic temperament, about equally mixed with a fair share of the sanguineous, but with very little of the nervous. The life the Patagonians lead is favourable to the maintenance of this debased type. Their food which consists greatly of mushrooms, fish and mice, is also of a debased character. The higher forms of vegetation are but feebly represented in Patagonia.

The Pampas of Buenos Ayres, are inhabited by a division of the Patagonian race, who are even more barbarous and cruel

than the natives of the coast, which is contrary to the evidence of Azara, who considered them as superior to the tribes inhabiting the sea shore.

The Caribians are a widely distributed family of races, extending through a great part of South America and the West India islands.

The Caraibs are an important division of this race, they resemble the Mongolian, especially that division of it that inhabits the Malay Archipelago, in their lawless, rapacious and cruel propensities, and tendency to crush and subdue weaker races. The Guarani and Tupi, who inhabit a large part of Brazil, are mild compared with the Caraibs, and are unlike them highly susceptible of the influence of civilization.

A very large portion of Brazil is densely wooded. It is "the paradise of plants," for here forests attain their greatest extent in the world. The borders of the Amazons and the neighbourhood of Pará, are especially rich in insect life; particularly butterflies. This region affords the greatest number of species in the world. The population lead "a butterfly life;" they work but little. The butterflies of Europe are few in comparison, and so is its idle, effeminate population. If these insects represent the aborigines, the humming-birds represent the mixed Indian and European population, or "Mamelucos." Casual observers doubt whether humming-birds, are birds or insects. By their minute size and graceful movements they almost persuade us that they are "winged gems," or the precious treasures of Brazilian mines sprung into life, ready to die to decorate the attire of the nymphs of that fairy land; and dispute with brilliants, with rubies and with aqua marines, the title of the brightest decorators of their costumes.

The coast line of Africa is the least indented of any of the continents of either the Old or New World. In harmony with this, its populations are less maritime than many races, although it must be admitted that the Negroes make better sailors than do most other uncivilized races; owing to their docility, strength, and power of adapting themselves to circumstances.

Africa is the land of great deserts, which stretch almost across it, cutting off the North from the centre and equatorial regions. This has been the chief bar to Moslem conquest and perhaps elevation through it, of the Negro "in the scale of being." This desert lying between different regions of Africa, may be typical of the want of sympathy and community among its races, which has prevented them from uniting to form great states.

Africa has few rivers of great length: the Nile is by far the largest, in fact, the only one which can rank among the great



THE PRIMEVAL FOREST OF BRAZIL.

streams of the world. The direction the outlet of rivers takes, is mainly that followed by their commerce and emigration. That of the Nile is principally North towards Europe. That of the small rivers in Algeria and Morocco is mainly towards France, Spain, Portugal, and Britain; while that of the Niger, Senegal, Gambia and Congo is towards America, the direction the population took in its forced emigration.

Africa has few islands compared to America, Asia, or Europe, in harmony with which its populations have little extensive commerce by sea. Madagascar is its largest island and those of Socotra, Seychelles and Zanguebar are important on the East coast. The aboriginal commerce of Africa was mainly in the direction of, or in connexion with these islands. After the discovery or re-discovery by Vasco de Gama of the Cape of Good Hope, the western islands in the Atlantic, began to engross a great portion of the African commerce of Europe, being as it were half way between Africa and Europe. On the discovery of America, they were found to be suitable ports of call for ships bound to the West Indies, and the success of black labourers in the Canaries, was an inducement to their introduction into the American isles.

The mountainous systems in the interior of Africa have been little explored. If Asia has a chain of mountains denominated the "Mountains of the Sun;" Africa as a less promising country has a chain more or less mythical denominated the "Mountains of the Moon." Is this region inhabited by Man? We have all heard of "the man in the moon;" his evidence we fear has often been admitted on a question like this, by superficial geographers and ethnologists.

A great part of the central regions of Africa is probably mountainous and well watered, but it is not generally a land of great lakes or rivers. Many lakes or rivers like those of Australia, become nearly or totally dry at some seasons of the year, and the largest, Lake Tchad, has no communication with the sea; significant of the isolation of the "green spots" in central Africa, calculated to enlist the sympathies of civilized humanity.

The region of the great lakes of Eastern Africa, such as lake Marawi and Victoria Nyassa in the neighbourhood of the now believed source of the Nile, is a well watered country; civilized compared with the less fertile South. Except in the neighbourhood of the greater rivers or the Mediterranean sea coast, Africa is very dry.

The North of Africa is particularly subject to the hot winds of the Sahara, they exert a blighting influence on vegetation, and are pernicious to man and beast, they render yellow in a

few hours, tender and succulent grass, or the delicate acacia. The hot winds have often been compared with the incursions of marauding tribes, such as the Kabyles, who leave their desert homes like a cloud of dust, and delight to reduce "to a desert" the most civilized villages of the coast. Like the Sirocco these marauding incursions are not of constant occurrence. Intervals of peace and tranquillity are allowed, during which the blade rises anew, and the buds expand into a luxuriant growth of leaves, and another numerous generation fills the gaps in the Human population. But for this, the Storm of Man or the "Elements," would wreak its cursing blasts upon a callous soil.

The great desert whose sand absorbs heat often to the extent of 130° Fahr., radiates it so rapidly during the night that water exposed to the wind in the clear moonlight may freeze. The inhabitants are both cold and hot blooded. Hot as the bird :—cool as the reptile. Prone to shed blood to the utmost in battle ;—that is to say "in the hottest blood," as well as to massacre relentlessly in "the coldest."

The lion is distributed over most parts of Africa. The Barbary or North African lion, is said to be the most formidable, and the horse of North Africa is superior to that of other regions ;—the "barbs" in particular : their masters are the most spirited of African people. The ostrich of North Africa is likewise larger than that of the South.

Egypt owes its fertility, for which it has been renowned from ancient times, to the Nile which has brought down much rich mud from more favoured countries ; it has overlaid with alluvium the desert sand. This fertility in Egypt is *not of Egypt*, it is the spoil of other lands. The civilization of Egypt was probably due to the influence of races superior to the present Copts. The ancient grandeur of the kingdom, till lately contrasted wonderfully with its littleness ; and it is only recently when Western blood and influence, like a Mediterranean breeze, began to revive the parched Egyptian coast, that it has sprung anew into life. This is a strong argument for the inertness of Egypt, except under the Influence of external pressure.

The Delta of the Nile, is so called from its resemblance in shape to the fourth letter of the Greek alphabet, which is triangular. May the form of this letter have suggested that of the pyramid ? or may the form of the pyramid have suggested that of the letter ? The figure of the pyramid is but the multiplication of triangles, and when viewed in front appears as one. Egypt has deserts on each side of it. In ancient times as in modern, its civilization was superior to that of the countries immediately adjoining.

The neighbourhood of metallic ores, or the possession of coal, greatly stimulates the industry of a nation, and when not found, neglect of metallic arts generally occurs. Egypt in ancient times was blessed with much civilization. The skill the ancient Egyptians attained in the use of metals was probably the result of teaching from abroad. The metals not being obtained in Egypt would not have found their way there, unless their uses were known; and their uses could only be known through long familiarity with them, which would involve successive experiments near the spot where they were found. WE HAVE HERE A CLUE TO THE SOURCE OF EGYPTIAN CIVILIZATION. The abundance of siliceous sand and salts of soda, obtainable in the natron lakes of this country, facilitated the manufacture of glass, which was perhaps earlier in use in Egypt than elsewhere.

Upper Egypt is not subject to rain, but in the Delta rain frequently falls from November till March; yet only on a few days. The water of the Nile is the most wholesome for drinking purposes, of that of any tropical river; this is attributable to the small amount of organic matter it encounters in its course.

Nations who dwell in regions at once hot and dry, are mostly divisible into two classes; the thin, wiry, muscular, active in mind and body; and the flabby in mind if not in person. Natives of temperate climates who live long in the tropics, are generally of either of these classes. The Arabs and Kabyles belong to the "wiry" division, and the Egyptians to the "flabby" and soft fleshed. The Negroes are somewhat between the two.

The great Berber race of North Africa, resemble in many points of character the Arabs of Arabia. The same love of freedom, the same lawless spirit, the same minute subdivisions of tribes, the same contempt for the luxuries of life, which is in harmony with nations living in deserts. There few comforts are to be procured, either on the spot or from a distance, owing to the great difficulty attending the transport of foreign luxuries over long desert tracts.

The Berbers of the Atlas chain vary considerably in habits. It is generally said that the Kabyles are incurably wild, and incapable of settling as quiet, orderly citizens. It is probable that they will not be reclaimed to any great extent, and brought within "the sheep-fold" of civilized life, until either the moral or physical desert, or both, "shall rejoice and blossom as the rose." Will Artesian wells—typical of French influence, with Christianity be a great means of accomplishing this?

The sea coast of Northern Africa, was early occupied by races, largely infused with the blood of the natives of the Arabian peninsula. The country they occupied was in some regions very fertile, but required culture. An extremely barren soil is

typical of a nation barren in the courtesies or the elegancies of life—the graces of civilization.

The richest portions of tropical Asia and America remind us of great resources and talents, either little used or abused ; for the natives of these regions develop the resources of their country but little, compared with the races who generally inhabit the temperate regions of Europe. But a fertile soil, and some disposition to cultivate it, as is the case with North Africa and its inhabitants, aptly illustrate the status to which they might and did attain amongst nations, who cultivated letters, science and the arts. This was high when viewed from a mediæval stand point. It was wafted across the Mediterranean sea, like a scorching wind or “an army of locusts,” which settled and increased in the neighbouring country of Spain, and threatened until checked by Charles Martel at Tours *Anno Domini* 732, to involve Western Europe in one Moslem yoke, in religion, politics and art.

Senegambia is a country of Western Africa between that vast region over which the Arabs and Negroid tribes wander, and true Negroland or Guinea. It is very rich in natural products, vegetable, animal and mineral. The inhabitants of it are various. Sierra Leone, the principal British settlement, being an *entrepôt* for tribes of almost all regions of West Africa.

The Senegambians are commonly considered three races: the Mandingoes, the Joloffs and the Fulahs. The Mandingoes are usually considered the most superior of the black races of Western Africa. Their features are straight, but their hair is woolly. They undertake long journeys by land, for commercial purposes. They are successful traders and diligent cultivators of the soil, but are too independent to make such submissive servants generally as the less superior tribes. They clearly cannot be classed with the Negroes of Congo or Eboe, who differ from them so much in physical appearance.

These Congo or Eboe tribes in features more nearly approximate the ape, than do the Senegambian blacks. They are more “ape like” in character, and have but a small proportion of those qualities which pertain to the higher races of humanity, but are lively, chattering, and inclined to mimicry; inconstant and easily led and duped. They are immensely observant about trifles, in contradistinction to the Senegambians, who are grave, quiet, persevering, somewhat melancholy and not easily controlled.

The Joloffs and Fulahs somewhat resemble the Mandingoes. Their states are larger than those of the tribes farther South. They pursue war in a more systematic manner, and less like wild beasts. The Fulahs in particular have had a prophet

with the audacity to imitate Mohammed in his foundation of a New sect, which like its great prototype carried on war successfully for the prosecution of its doctrines. How different are these traits of character from those of the tribes of Guinea generally, who however are not all reducible to the ideal Negro type. Tribes approaching in physiognomy the Mandingoes and natives of Soudan, are found at several points; these differ greatly in character, some being mild, docile, and affectionate, and careless about property; others are savage, cruel, blood-thirsty and avaricious, but more independent, constant and brave.

Guinea is the country of the largest land animals on the globe. Here does human nature vying with brute life, attain its maximum of savageness, and cruelty for its own sake. There is Dahomey with its periodical massacres or "customs," and slavery, unsoftened by Christianity and civilization. There the gorilla, the chimpanzee, and the koolo-kamba reign in the forest. There are the elephant, rhinoceros, hippopotamus, the ostrich and numerous birds of gigantic size, as well as colossal insects and land shells, capable of containing a pint of liquid. The *Dracæna* or dragon-tree and the gigantic euphorbias, illustrate the monstrous growth of vices in this part of Africa, as all this brute force does the vicious and savage strength of the human population. The lion, the largest of the Carnivora, is here, and in common with the bulk of these great brutes, has not been subdued by the natives. The extirpation of these creatures in Europe, is significant of the comparative subjugation of his worst and most savage passions by the civilized man; which now rage in Africa in unrestrained atrocity.

The Bushmen or Hottentot race is usually considered an abnormal one; their low stature and low foreheads suggesting a dwarfish division of humanity. Their complexions are yellow or inclining to clay brown. Their heads are remarkably flat on the top, if not concave in the centre. The forehead is prominent and narrow. The expression of the countenance is very unpleasant. They are a fierce warlike race, with considerable intelligence of a depraved character. Their cheek-bones are high, and remind us of the Mongolic division, whose roving habits they pursue. They clearly present a great analogy to the nomad Tartars, as well as some resemblance in physical and moral characteristics. Their language, which few Europeans can stoop to acquire, resembles the sounds uttered by animals, such as the pig, the duck, the goose, or the snake, all of which are uttered through the nose. Their senses are remarkably acute. They make war on man and beast with poisoned arrows, and are extremely irascible and violent.

Their food is frequently as depraved as their bodily habits. They eat locusts, snakes, beetles and terrestrial mollusca, or any animal indifferently.

The name *Kafir*, now applied to many tribes of southern Africa, was first given to these people by the Mohammedan voyagers, who thus designated *infidels*. The Kafirs of South Africa, are much more energetic and intellectual than the Negroes of Guinea are generally, and possess more elevated foreheads. They practise circumcision. They more nearly approach the Semitic-European race in physical appearance, than do the Negroes, particularly in the form of skull in the upper portions. Their moral character is superior to that of the Bushmen, or that of most savage tribes of Africa. They are Monotheists apparently, with superstitions added, such as the supposed presence among them of the souls of the departed :—they offer sacrifices to *Uhlunga* or a Supreme Being.

The nations that live beyond the tenth degree from the equator in Africa, are more commonly superior to those living within these limits. There are exceptions doubtless, as is the case with the Bushmen, who however belong to a division of the Human race whose "centre" is probably not in Africa. The Galla race so distinguished for energy is another exception. The Kafirs are apparently allied to them in character and in origin. The Gallas are a wild and ferocious race, who are the terror of the Abyssinians, and render the approach to that country from the Ajan coast so difficult. The Gallas are evidently a race intermediate, between the Arabs and the Ethiopians. The natives of Abyssinia are another but similar race. Abyssinia has been for ages converted to Christianity. The language greatly resembles Hebrew, and many of the customs and habits are said to be like those of ancient Israel. The Abyssinians are described as a melanic though handsome people. They inhabit high lands, and are superior to most of the races of the plains of Africa.

The Caucasian division of Blumenbach includes the so-called Indo-European and Syro-Arabian races, which are separated from each other by authors on the ground of difference of language. This race which we term SEMITIC-EUROPEAN can exist in every climate, unlike the Mongolian and Ethiopian types ; but as a whole is better suited for a temperate climate. Its capacity for universal existence is however extremely significant ; and the variety of qualities possessed by this race harmonize with varied regions. The Indo-European is a lingual rather than physiological division, throwing light on

- history and migration, rather than upon the paternity of races, as language taken by itself commonly does.

The kindred Celtic, Teutonic, and Slavonic nationalities have long inhabited Europe, and have, especially the Teutons within the last few generations, emigrated to a great extent to extra European, but generally temperate regions of the Earth. The countries inhabited by these nations, are mostly temperate, and so are the passions of the people, especially as contrasted with those of Mongolian and Ethiopian races.

The Ethnology of Europe is not so varied as is commonly supposed. The Laponic race is the most Northern in its habitat. It is migratory like its congener the Mongolian, which together with most of the Northern and Central Asiatic tribes, clearly belong to one division of the human family. The Laps migrate much, and they have a wide extent of territory given to them in proportion to their population. They have high cheek-bones and wide shoulders, in common more or less with the whole Tartar and Mongolic family. The country is wild, rough and inhospitable, but adapted to a population who live almost entirely on the products of the animal kingdom. The animals of this country are coarse and ravenous in their habits, namely the leming and the glutton with an occasional polar bear. The latter may be regarded as a type of the Russian power, which rules in a great part of Lapland. The Laps are distinguished for activity, industry, obstinacy and shrewdness, but they do not produce great works. Similar remarks apply to the Esquimaux, who are however inferior in intellectual capacity to the Laps.

Scandinavia is a name old as the days of Pliny. It included modern Norway, Sweden, Denmark, Lapland, and Finland. But the Scandinavia of the theorists of the present day, includes only the three first named. It is a varied region. Norway is extremely mountainous, and much indented by the sea; it abounds in rivers and lakes. Very few rivers comparatively empty themselves into the northern ocean directly; the course of the rivers in Norway and Sweden being towards the more inland seas, as the Skager Rack and Kattegat; the Baltic and the gulf of Bothnia. The migrations of the Northmen have been mainly South West, namely to France, Britain and other countries in that direction; while those of Sweden have been more due South and East, to Germany and Russia. Norway is the land of mountains, islands, bays and lakes. The mountainous character of the country, typifies the independent disposition of the people; while the indented coast line, and

abundance of water, illustrate a maritime and aquatic population.

The Swedes are also a very maritime people. An eighth part of Sweden consists of lakes. Sweden and Norway are not manufacturing countries; the difficulty of communication between isolated districts, and the scattered situation of the population, have prevented the cooperation necessary to manufactures on a large scale. England and France do not suffer similar disadvantages. The Swedes and the Norwegians are



A NORWEGIAN FJORD.

great as individuals if not as communities. The more isolated men are, the more their individual resources are developed, and the less they are inclined to adopt the "manufacturing principle,"—the subdivision of labour—which is so favourable to the accomplishment of great deeds by a nation. Sweden and Norway owe their present position in Europe,—that of a power of the third class, to the unwillingness of their sons to sink their individuality, to become great as a community.

Germany is an extensive region, and possesses a considerable variety of animals and a varied soil. The population is mainly Teutonic, but a considerable portion is of mingled Teutonic and Slavonic descent. All the comforts, and most of the luxuries of life, are produced in this great country. The wild animals have not been so extensively subdued as in Britain.

Germany has no ocean coast line, and it is not much indented even by that inland sea the Baltic; hence its population is less inclined to marine excursions and foreign commerce, than those of Holland or England. Relations beyond sea are an outlet for the energies of a nation; they frequently prevent "intestine brawls;" by diverting the attention of prospective combatants.

Amongst carnivorous quadrupeds Germany has the bear and the lynx, which we do not possess.

The Germans have for ages been famous for their mining operations. They have dug deep into the earth, and extracted from its "bowels" rich ores, which after having been refined by the chymists, pass through the bowels of men into the earth again. They occupy important offices in society; they are useful or ornamental until they rust into dust. The Germans have a habit of "digging as deeply" into subjects as they do into the ground. The first step in any excavation is to cast up "dirt," which is the usual preliminary also to a moral investigation.

France is less gifted in minerals than Germany. She enjoys a more equable climate, but not so equable as the British Isles. In Germany the climate varies greatly; this may typify the varied character of the Germanic confederation, which "blows hot or cold," according to the season. France produces some of the finest fruits, flowers and agricultural produce known, which will become every year more perfect, as agriculture is more scientifically practised. France is not beset by great mountain chains like Spain. The rivers are mostly navigable throughout the greater length of their course. The greater rivers empty themselves into the Atlantic or the Channel, while only the Rhone amongst the larger rivers pours into the Mediterranean. The marine commerce of France is mostly in the direction of these great rivers, at least her export is. The country is little cut up by natural barriers to centralization. The French people in harmony with their natural advantages, cultivate the elegancies of life, as well as what is solid; to an extent greater than do most nations of Europe. They have not the strength and solidity of the more purely Teutonic nations, but are not so wanting in these as has been alleged. Their chief defect appears to be the not carrying of pursuits to a sufficient extent.

Spain is inhabited by a variety of races, who have been kept separate, greatly by the irregular course of the rivers, which admit of so little uninterrupted navigation. The mountains greatly split up the country. It was long divided against itself, and still provincial Cortes retain in the North their ancient privileges, having a chain of mountains as it were to guard them from the Grand Cortes at Madrid. Spain has great mineral resources and possesses much fertile soil, but at the same time much waste land, which may together, represent the moral state of the kingdom.

Russia in Europe consists of great plains interspersed with no mountains worthy of the name. This is significant of a want of elevation in the population; they may be energetic and industrious, but show a want of appreciation for poetry or loftiness of idea and thought.

The Dutch notwithstanding their great energy, are inelegant in their tastes, and in common with most nations who live on flat ground, have but little sympathy with poetry and romance.

The number of nationalities included under the Russian sceptre, is far greater than that under any other power, except Great Britain. A large portion of Russia in Europe is swamp, incapable of cultivation; and an even greater portion consists of Steppes, over which herds of cattle rove.

Italy being the most peninsular country of Europe, and having Spain on the West, and Greece and Dalmatia on the East, with Germany, Switzerland and France on the North; is cut off certainly by the Alps, but is still accessible. Italy is amongst the most central countries in the North-Eastern quarter of the globe; and Rome is nearly in the centre of Italy: hence WHEN EMPIRE STALKED WEST, IT AT ITS FOURTH STRIDE, SETTLED AT ROME.

Italy is intended to be a maritime country; but its population, except in the more Gothic provinces, such as Genoa and Venice, can hardly be said to be at home on the sea. There is much fertile land in Italy, but pestilential marshes abound. The climate may be said to be fine, but the lease of human life is in general much shorter, than in England or France.

Italy is a poor country, though rich in natural resources. The population cultivate art and science, more than they do morals or commerce; in harmony with which the vine, citron, olive, and other fruits, are more generally relied on than root or cereal crops: Sicily on the contrary is a great grain country. The pestilential swamps of Italy which have been so little drained, typify moral sores, which although they pervade many parts of Italy are most flagrant in the neighbourhood of Rome, situated near the Pontine, they should be called *Pontifical*

marshes. Much of the immorality of the population of Italy, is doubtless to be traced to Punic blood, which reminds us of the *Sirocco* or the *Libeccio*; unhealthy winds from Africa; for like Hannibal they bring desolation to Italy.

The British Isles are small in size compared with other European countries, and yet their position in the world of our day, is of the first importance. In geographical position they approach the main centre of present civilization. This location has much to do with the importance of the country, but a race trained in such a neighbourhood, would always possess advantages, over other races or divisions of the same race, farther removed from a great focus of civilization. The Teutonic division which includes the Saxon, Angle, Scandinavian and other minor tribes, is the race possessing most self-control, or balance of heat and cold. They inhabit the more temperate regions of the earth; and the more moderate members of these races, inhabit likewise the MOST TEMPERATE OF THE COUNTRIES OF EUROPE,—the British Isles. The less temperate in passions of the Teutons, are apt to go abroad and live in less temperate countries such as North America. And here their immoderateness would appear to have been increased by various combining agencies; doubtless partly climatic, as is the case with the European settlers in South Africa and Australia.

The strata of the British Isles are very varied, perhaps more so than almost any other region of the earth of equal extent. This too is in harmony with the varied qualities of the gifted races inhabiting these Islands. It is this combination—physical and racial, which forms the foundation of the renown of Great Britain. The present fauna and flora of Great Britain are on a moderate scale. There is no animal here that we cannot easily master with scarcely an effort. The dominion of Man is nowhere greater over the brute creation. It is true other countries possess animals of a larger size, which are slaughtered by inferior races; for man is always more or less superior to the brute; but in no country is his dominion so great or his position as master more apparent. A powerful brute population, we take to typify the more brutal and savage passions of Man. Its cruel ferocity typifies his, as its mildness and gentleness does. In a Millennium of righteousness and peace, the venom of the serpent, and the cruelty of the lion, are to be turned to harmless gentleness.

We have however in Britain a vigorous fauna, as contrasted with that of some other countries. To begin with our quadrupeds: we have at present no indigenous pachyderms, our pigs being of domestic breeds. The wild boar once among us, typified

a pariah population like the races now extinct, of which we have however indistinct traces. The pigs of foreign introduction, by their sensuality and grossness, eminently illustrate the degraded portion of our population, which however "yield the palm" to Africa, which possesses many large pachyderms and a population coarse, thick-skinned, and swinish in habits.

The Carnivora in Great Britain are at present small and insignificant, compared with those of other lands. The wolf has long been extirpated, but as might have been expected first disappeared in England, then in Scotland and lastly in Ireland. The fox, were it not preserved, would long since too have disappeared. It is a type of the "wire pullers," who are so much protected by society, contrary to its own interests; but with the view of preserving the balance of power.

The badger one of the most important of the British Carnivora, is a quiet nocturnal beast, but if much "badgered" becomes obstinate, and fights to the last, in which it becomes a type of a large class of Britons, who like to be let alone, but when ill used, can fight.

The otter, a type of the Scandinavian fishers of our population, is sparingly distributed. The weasel and martin family are but feebly represented in Britain, compared with some other regions. They thirst desperately for blood under all circumstances. Our cutthroat population is fortunately *small*, but still not *extinct*.

The Insectivora are better represented than other classes of mammals in Britain; we have hedgehogs shrews and moles, to the number of six or eight, which pick up our insects. These remind us of detective police, or those who assist in the protection of our revenue against fraud. Still they are small compared with those of other countries. When they are of great size, they resemble and typify excessive exactions on the part of government officials, who, like the large Insectivora of foreign lands, devour not merely insects, but higher animals. Insects may be taken for the moment to typify poachers, and those persons who are enemies to our supplies of provisions, while the larger animals, typify the producers of food. Those who keep them in check are like the officers of revenue, who in our country merely protect its interests, but in some lands, actually prey upon the best interests of the community.

The bats are the most numerous of our Carnivora but the least to be dreaded. Their small size is significant, and is emblematic of the less treacherous and more frank and open character of our population, than that of most other countries. Still we have our bats, which typify those who walk abroad during the shades of night, to seek their prey.

We are entirely destitute of Marsupialia or pouched animals, —the lowest of the Mammalia, which is highly significant and typical of the absence in our country, as in Europe, of the lowest races of man ; those who habitually commit what is unnatural, like the marsupials who bring forth their young prematurely as it were, if contrasted with the placental mammals.

The sole indigenous ruminants, are two species of deer. Several other species of this and other genera formerly existed ; some perhaps the companions in their wanderings of an early race of man akin to Mongols ; and whose disappearance before the march of more docile races or breeds of man and domestic animals is coincident ; and whose graves alike lie beneath the strata of authentic history.

The extant individuals of the genus *Bos* or bull, represent a rough strong race like the Fins, not now found in England or most parts of Western Europe, of whom traces exist, like those of the *Bos taurus*, or Lithuanian bison, and like it still point to Russia as the outpost of Mongolian influence. It is reflected from the West, yet has an organization truly Mongolic.

A great part of the inhabitants of Russia clearly belong to the "Centre" of the Mongolic division of the human family. But the present breed of bulls in Europe and in England especially, typifies the Teutonic race ; the finest example of which is "John Bull." These are tractable, having none of the wild ferocity of the untameable, semi-savage tribes of Asia ; but are like the agricultural bull or domestic cattle in so many respects.

The deer kind now existing in Britain in somewhat diminished numbers, may represent Celts, or at least that family of nations as contrasted with the Teutons ; and like them give way before the bull and his analogue. Our domestic animals are in themselves typical in an eminent degree. In a future chapter, sheep will be taken in accordance with the Scriptural idea, as representative of those eminent for piety. We have certainly the best breeds of sheep in the world as well as the most valuable missionaries : while horses, of which our breeds, also of the best, may represent the efficiency of our forces, civil and military. The beaver is gone along with the earliest human inhabitants of the marsh, and only one species of squirrel enlivens our woodland landscape.

We are less eaten up by Rodents than the inhabitants of some other countries. We have five mice and rats, and one dormouse. The domestic mouse, may represent the Welsh, the black rat the Saxons, and the Norway rat the Normans, who followed one another from the East at different periods, in a manner analogous to the coming of these different nations.

The voles or field mice to the number of four, are great pests, they are smaller than the rats. They are types of a foreign or vagrant population, who live at our expense, appearing to the casual observer to give but little in return. The hare and rabbit are by far the largest of British rodents, but are the most timid. Their skins and flesh are much esteemed. Owners of valuable property are frequently said by politicians to be a timid class, whether they reside in boroughs or in the country. Those who reside in the country are perhaps the most timid, or at least have been supposed to be the most afraid of the dangerous classes; but those who live in boroughs increase more rapidly, and are supposed to be greater enemies to crops than the more aristocratic hare and his type.

The various species of seals found on our coast represent its human fishers of Danish, Norwegian, or Welsh extraction, and by their various habits, typify those of these British tribes.

The birds of Great Britain are very numerous, and include most of the aquatic species of Europe, as might be expected, as part of the fauna of an Island; and is in harmony with a human population the most maritime in Europe. The birds of prey are well represented; the leading families being admissible as residents or visitors, either regular or accidental. The vultures have been once or twice killed here, but have no *home* in Great Britain. Their residence is properly speaking in those countries the prey of despotism; they being a type of despotic, Imperial rule, which has only occasionally visited Britain. British birds generally, are more distinguished for grace, nobleness of aspect, beauty of song and harmonious colouring, than for excessive brilliancy of plumage. They harmonize with our landscapes, which are varied, rather than extremely brilliant in sky, or in the tints of the blossoms of the earth. The rich luxuriance of the tropics, either in plant, bird or insect life, is wanting here; except in a few cases, or on a small scale, but yet there is much to admire, much to awaken interest, and encourage study and reward culture. Although the fruit may not grow to so large a size spontaneously, yet flavour may compensate much, and a great size be within reach of attainment, when an "Ossa" of culture is heaped on a "Pelion" of flavour. Then, and then only, things great and good will attain their zenith.

The various genera of British birds are typical of the inhabitants of the British Isles. The eagles represent royalty as the falcons do princes, while the large owls represent the gigantic "limbs of the law," and the crow kind attired in black the various learned professions; emblems which will be considered generically in our essay on birds. The song birds of England are

celebrated, but those of Germany even more so. The Germans prize singers amongst birds and men, more even than we do. We are more fond of song birds than the French; thus they are less destroyed by us. The small land birds of England are less numerous in proportion than the water birds; although perhaps not so much so, if we consider our area, as contrasted with that of Europe. This is especially true with regard to the larks, the finches, the buntings and thrushes, of which Europe possesses twice as many species as Great Britain; but the whole of Europe does not possess twice as many ducks, gulls or waders, which are all water birds, and point typically to our position at sea, as regards fleets, mercantile and naval. These buntings, larks and smaller land birds more emphatically represent the *bourgeois* and lower classes, who in the aggregate are of course far more numerous in Europe than in Britain.

The puffin and its congeners represent races who have passed, or are passing away. The extinct great auk typifies the early Mongolic population, while the razor bill and guillemot, do the outlying remains of Finnic tribes, who in remote corners of our islands still cling to primitive habits and usages.

British fishes are very numerous, nearly all those of the Northern seas of Europe are found here. If the sea birds represent the vessels, the fish which feed the birds, represent the crews, which would carry the illustration of a maritime nation still farther. Many types, connecting British fishes with the races inhabiting the British Isles, will be pointed out in the chapter more exclusively devoted to the finny tribe.

The reptiles of Great Britain are small and insignificant, compared with those of other countries. If reptiles are types of degraded men, we are fortunate in affording so few examples of both in our land. Tropical Africa and Asia abound most in reptiles, in harmony with which the human population has sunk lower than in most countries.

The insects of Great Britain are pretty numerous, but on a less gigantic scale than those of some other lands, and are less brilliant in tint; but in delicacy and harmonious colouring, are not to be surpassed. Most orders of insects are well represented; as might be expected in an island, whose strata are so nearly the type of The World.

The animals found in the British strata show this to be eminently the case. This is a subject of great interest and would be in harmony with the fact of the races inhabiting the British Isles, being the focus or concentration of the peculiarities of most other races. In the extinct animals which we shall treat of more at length in our chapters on geology, do we alone find the links wanting to complete types of universality which

are discoverable in our Island and its inhabitants. Thus we have remains of tigers, hyænas, elephants, rhinoceroses and other creatures at present natives of intertropical climates, which are doubtless the types of former human inhabitants, and whose remains turn up at the feet of an elevated race in the days of their civilization, and apparently point to peculiarities in the nature of man, from which he is never exempt.

The flora of Great Britain is eminently significant. Amongst timber trees, the oak, the fir and the beech, take the place of willows, which though common enough in Britain, are still more characteristic of the Northern regions of the European continent; while evergreen trees, with rich, thick and oleaginous leaves, such as the laurel, the orange, the myrtle and the cypress, harmonize with a climate where little frost occurs.

Nearly all our trees of any size shed their leaves every year; and every year they are renewed. This habit is very different from that of evergreen plants. The evergreen leaves so characteristic of the foliage of other lands, appear to illustrate an extraneous civilization; a life as it were less in the root than in the leaves, which if taken away the root dies. The plants which shed their leaves annually, typify the nations who possess a power of self-renewal. The sap goes down to feed the root to return with increased vigour the following spring. Of such a character is the elastic power of the Teutonic nations.

The oak is a preeminently Teutonic emblem. Its durability, hardness and incorruptibility are proverbial. It is equally serviceable on land as in water; like the Teutonic race as contrasted with the Celts, who may be represented by the beech. This wood will not stand great drought or water without loss of form; but is excellent as a wedge for splitting; or as rough handles for the tools of the Teutonic workman. It is apt to get cracked, yet does not split. The Celts like their analogue the beech, although often "tools" in the hands of the Teutons are uncertain; they are apt to be "warped."

Great Britain is eminently agricultural as well as pastoral, and its population like that of Europe generally, is mainly supported on cereal grains, and on wheat the choicest of the cereals, which typifies their great religious, moral and intellectual advantages. Wheat grows most commonly in countries, best suited for the maintenance of the peculiar gifts and high qualities, possessed by a Teutonic population. Some of the best pasture grasses known, grow in Great Britain and Europe; hence their availability for the feeding of a stock unrivalled in the world; and whose milk, butter and cheese are amongst the finest. These pastures represent physical advantages; that is to say of

bodily constitution, in contrast with the cereal grains which typify moral and intellectual advantages.

The flora of Great Britain numerous in genera and species, is more remarkable for delicacy and minute tracery than for grandeur or gorgeous colouring; typical of the modesty which greatly distinguishes the nation both as regards freedom from indelicacy and dislike of vaingloriousness. Many flowers will be alluded to in a future chapter, as illustrative of traits of character and virtues especially English.

The tendency to neglect the cultivation of the cereal grains and live on the potato, is typical of the lower moral standard of the Celts. They thus chose a food of a lower character as contrasted with that of the Teutons. The potato in contrast to the wholesome cereal families belongs to a poisonous class; that of the nightshades, which contains so many deadly plants. These poisonous properties are typical of a religion akin to paganism in image worship. Wholesome food is mixed with poison, which fully illustrates CHRISTIANIZED-PAGANISM. Right and wrong lie greater in use and abuse, than in the abstract: hence the importance of culture and balance, by which the controlling power of Man is shown. We owe less to climate and soil with regard to the produce of abundant food crops than do many other nations; more is left to skill and industry than in most other countries. The high qualities of the race are here developed by being called into exercise.

The minerals of Great Britain, illustrate national character in an eminent degree. Coal is one of our most important minerals, and is more abundantly found in the British Isles than in any part of the world of equal extent. This coal is a type of condensed energy such as the Teutons display; and which is more manifested, singularly enough in the coal producing districts of Great Britain, where the population have often coal black hair, as in South Wales, Northumberland and Durham. They are more energetic than in the Southern and Eastern regions, which produce no coal. Coal is a coarse, dirty mineral, but it contributes to diffuse a genial warmth throughout every district of the country. The colliers are generally admitted to be a coarse and somewhat gross section of the community, but those who visit them in their humble homes are likely to have "a warm reception." It is sometimes said that the bulk of British energy is "Northern;" and it must be admitted that energy and self-reliance are more common in the North and central districts of England, than further South. But with this great power, there is much "flame," "flash" and "smoke," typified in a "sea coal fire," as contrasted with a charcoal fire, which can be obtained from local material in

almost any place. This flame is clearer and hotter than that of the coal, and is much purer and more refined. It burns with little noise, flare or smoke. This is typical of the Southern man of energy, who is much more refined than his Northern congener.

Iron and coal so necessary to each other, are generally found in close proximity. The iron ore may here represent the physical surroundings of a nation, while the coal represents the nation itself. The Teutons are the principal workers in coal and iron throughout the World. Wherever they go they turn up coal, be it Australia, America, New Zealand or Borneo. The "charcoal iron" is the purest in quality, and being mainly made in Sweden, may typify the Scandinavian element amongst the ethnic forces of Europe; while the iron made with mineral coal typifies a coarser Saxon element.

The cast iron so largely prepared from the clay ironstone, exactly answers to the "Iron and Clay" of Nebuchadnezzar's Image, which we shall dwell upon in our "Chymistry of the Mind." It is from this IRON AND CLAY that the main greatness of the Teutons is derived. Gervinus is also right when he thinks that the toes "part of iron and part of clay," represent the Romanic and Teutonic nationalities, in the *locum tenens* of the Roman empire. The iron clearly represents centralized power, while the clay represents oligarchism;—and is by some thought to be a type of democracy. Such might be as true at one Age of the World, as the other might have been at a former period. The yield of ores in Britain is vast indeed. A large portion of the metal of the world is turned out of our soil; a very large proportion of the tin of commerce is British; a goodly amount of copper, zinc, lead and the less abundant metals. Also a considerable portion of silver and a little gold accompany the lead ores of Britain.

We are industrious rather than thrifty as a nation. Were our thrift equal to our energy and industry, we might absorb much more wealth than we do, and keep the whole world IN LEADING STRINGS OR CHAINS, WROUGHT OUT OF OUR OWN METALS.

We are famous for pottery and stone ware, as well as porcelain. The civilization of Britain may be read in its jugs and basins, from the period of the Celtic unbaked ware, to the modern productions of a Wedgewood and a Minton;—a compass the points of which connect ancient and modern history. The same may be said with regard to glass, and is more or less true of other departments of the useful and ornamental arts.

The British Islands do not yield so many heating, stimulating, narcotic, or sedative productions of the Vegetable

Kingdom, as do such tropical countries as India, central Africa or America, that produce the tea, the coffee and the spices of commerce. The Teutons are the least excitable of European races, if we except perhaps the Laplanders and their allies. But they of all European races, are the most fond of condiments and stimulants; of foreign substances which they introduce into the daily routine of their consumption. They are much less affected by them than the Celts, who cannot stand the same amount of alcohol or pepper with impunity, as the Teutons, who possess much more vital force. The Celts have within them a natural "pepperness," and more "ardent spirits," and do not care to introduce such from without to the same extent as the Teutons. An indulgence which a Teuton could use and yet retain soberness, would make a Celt mad. The part of France where the indulgence in intoxicating liquors is greatest, is most Teutonic;—Normandy. The very moderation of the Teutonic character, is typified by so few of the natural productions of their temperate climate, being of a stimulating and exciting character.

The Cryptogamia or flowerless plants, have not their paradise here as in Arctic Asia, Europe and America. Significantly pointing to the absence of races of the most primitive and simple habits, such as the Ostiaks, Samoieds, Laps and Esquimaux. Their intelligence and civilization have not yet burst forth into bud or blossom, have not yet FLOWERED, but are in an Acrogenic state. We of course only here refer to terrestrial vegetation: the marine is Cryptogamic the world over, and exclusively so. The present Cryptogamic flora of the bed of the ocean, is indicative of an early or primitive state. It is analogous to some of the earlier strata of the earth, the age before that of flowering plants. "Progressive Creation," when applied to the bed of the sea, will result in the disappearance of a MARINE FAUNA and the probable substitution of flowering plants, far higher in the scale of creation. THEN THERE WILL BE NO MORE SEA.

The absence of palms in Northern Europe is highly significant; they supply within a narrow compass, more of the wants of Man, than any other class of plants. Food, clothing, furniture and shelter, are procured from one tree, and with little labour. Unlike that which involves the combination of a great variety of genera and species to produce, and with the utmost labour. Those plants most admired for their beauteous flowers, are in Europe not arborescent; neither are flowering shrubs so abundant in the North of Europe as in the South. In harmony with which, here less care is given to the purely ornamental than to the solidly useful. The flowering shrubs of

Southern Europe represent what is more exclusively ornamental and decorative in the position of ruler or governor. Show and display as a general rule, are more practised as we advance farther South.

The Teutons are less inclined to display than the Celts; and the inhabitants of Africa and India still more so than the Celts; and in the western hemisphere what is showy and gaudy, reaches its maximum of development in South and Central America,—limited means being taken into account. While the Canadians, who dwell in the coldest climate inhabited by the civilized population of the Western Hemisphere, are the plainest in their general style of living. Is this in harmony with the superior advantages of the sun which ripens glowing hues in natural objects, and induces Man to imitate their brilliancy in his works of Art?

The fruits of Britain as a whole, yield only to those of France and a few other parts of Europe, in glowing richness and delicacy of flavour combined; but their size is insignificant compared with the jaca, the mammee and the shaddock; yet afford as grateful qualities, and are more salutary than the more massive but less digestible fruits of the tropics.

Modesty is one of the most distinguishing characteristics of European nations as contrasted with the pompous Negro, and egotistical Mongol. In the lower ranks of European society, especially in those of the inhabitants of these islands, we see a luxuriant growth of modest virtues, which we may compare with the lowly strawberry, that rich fruit, the finest our land produces, but whose fragrance rises in wreaths to Heaven, the incense of the Earth.

The willow or catkin bearing trees, gradually usurp the place of the conifer or cone bearing trees, as we approach the arctic circle in Europe, and also to a greater extent in America. The seeds are greatly clothed with down, and in an early stage resemble the fur of animals; and is used by birds in the arctic regions as a substitute for fur, in lining their nests. Now these furry flowers, are eminently characteristic of regions producing many furs, but fewer fir trees.

A line running between the 60th and 70th parallels of North latitude is the Northern limit of arborescent vegetation. This line is higher in Europe under the influence of the gulf stream, and lower in Siberia, more especially as Kamschatka is approached. Beyond this line the vegetation is greatly Cryptogamic, and as we descend farther South, sedges and rushes abound, until they yield to grasses suitable for pasturage. The fauna of the continent of Europe is on a more extended scale than that of Great Britain.

As we proceed further South, we see a gradual approach to tropical vegetation. Evergreen trees and shrubs cast an impenetrable shade, which would be gloomy in less sunny regions. In the Southern parts of Spain, Italy, Turkey and Greece, one or two palms appear. These countries have in summer an almost tropical climate, and a portion of their inhabitants approximate in *indolence and immorality* to intertropical nations. The fruit trees of the South of Europe, or which flourish and luxuriate there, are uncongenial in Great Britain. The pomegranate, the orange and the vine, do not attain perfection in our climate without artificial heat; typical of the arts and manufactures of the South, which require to be introduced and cultivated with the utmost care, if they would at all compete with the manufactured articles of foreign introduction.

The poplar and the elm, characteristic of Northern Germany, yield to the lime in Eastern Europe, and to the chestnut, especially in France and Spain; while the home of the gloomy yew appears to be on the shores of the Black Sea. The South of Europe and Asia Minor greatly abound in the crown imperials, the tulips, the lilies and other bulbous roots. The nations who lived in these lands of flowers, were graceful and flowery in their expressions. Such were the Provençals of France and the Hebrews of Palestine.

The Dutch have been famous cultivators of bulbous roots, mainly to make money, but perhaps partly from a love of *multum in parvo*, or concentrated force in a little space. The growth of a bulb is like that of the Dutch, always expansive. In youth in height, in after life in girth; both individually and nationally. They find in these flowers whose growth is so regular, so certain and so little dependent on changes of temperature, a solace which contrasts favourably, with what otherwise might be gloomy in landscape gardening. The bulb by its mode of growth illustrates Teutonic progressive civilization. The Dutch division of the Teutons, put their feet forward slowly, but scarcely ever back; retaining tenaciously what they have once seized.

In Russia and Asia, especially in some districts, the horse chestnut usurps the place of the sweet chestnut. And here a human population, live greatly on *horse flesh*. The horse chestnut is a beautiful tree, but its wood is valueless, and its nuts although beautiful, are too astringent to be wholesome for Man's food. Many of these remarks applicable to the plants of Great Britain, apply to the plants of Europe; for the vegetation is of a similar character. The change is very gradual; willows, conifers, oaks, beeches, chestnuts and evergreen trees, form "zones," each suited to the climate. The fauna of Europe, is

also more extended but similar. No Pachyderms or Quadrumana, with the single exceptions of the wild boar and the Barbary ape, darken the gates of Europe: they typify Pariahs and Negroes, who rarely reside in its confines.

The domestic animals of the Continent are similar to those of Britain, and recall similar analogies. The lynx is one of the largest and most formidable of the Carnivora of Europe; at least of the true cats, but wolves and bears are much more to be dreaded than these. The lion was an inhabitant of Greece in classic times, but is now extinct; typical of the disappearance of the lion-like character amongst the Greeks. The characters of the wolf and the fox are plainly seen there, and these animals still inhabit the Morea. The hyæna once a native of Europe, has disappeared like the supposed primitive races its early inhabitants. The existence of three species of bears in the present day is instructive. There is the common brown bear of the Pyrenees, Spain and Switzerland. There is the black bear of Russia and Poland; and the white bear of the Arctic sea which sometimes visits Lapland. These typify ferocious and brutal races and governments.

A few more bats are found in Continental Europe than in Britain, but none of large size; yet some gigantic species are found in European strata. The Edentata or toothless quadrupeds and the pouched animals, are not European in a recent state, but the Rodents are an extensive family in Europe. Troops of lemmings and hamsters migrate from the North to the cultivated fields of the South, where they commit great devastation, as did the Huns or Vandals of old. The birds of the Continent are on the whole larger than those of Great Britain; not so much in actual size, but as regards number of large birds seen at any given place. The same rule applies to the insects in the departments of butterflies, moths, beetles, grasshoppers, bees and wasps. This greater animal power on the Continent of Europe than in Britain, is perhaps merely the natural consequence of a larger territory, which can of course command more varied and greater force.

Mesopotamia was the cradle of the Children of Shem. It is a region of more or less fertility, but inferior in this respect to Egypt or Palestine: it is subject to great vicissitudes of temperature. Its races have been subject to great vicissitudes of fortune; but like the country have always been a focus of observation;—Mesopotamia is one of the centres of the East.

The Semitic Nations in all ages, have had vast privileges, Moral and Intellectual. They possess more evenly balanced minds than do most other races, which is typified by their

central position, and demonstrated in the extraordinary influence they have had over other races. The soil produces the fruits of a tropical and temperate climate.

All Mesopotamia is a plain. Now plains are favourable for great cities and high civilization ; for the growth of luxury and the accumulation of wealth ; but are less favourable than mountainous regions, for the preservation of purity of morals and the cultivation of a high order of theology : the religion of Sabi was inferior to that of Moses. Israel perhaps pursued the study of Egyptian theology for a time in the plains ; yet were removed eventually to a mountainous region, lest they should be irrecoverably contaminated with the Mud of the Nile.

Babylonia and Egypt had some analogy ; they were both tracts which owed their fertility to the branches of great rivers ;—rivers which must be amongst the most important of streams as long as time lasts. Cities sprung up on their banks, which in their day influenced a great portion of the World. Palestine and Syria enjoy most of the advantages of Mesopotamia, without its disadvantages. The Creator in preparing a home for a race most specially favoured, gave to a land extremes of qualities, harmonizing with the extremes of qualities possessed by the race of Israel ; for the Canaanites went before as pioneers to break up the soil, afterwards tilled by a race of far higher culture and nobler constitution.

The mountains of Palestine are extremely *high*, and the valleys are extremely *low* ; significant of the exaltation and humiliation of Israel.

The fruits are especially rich, and attain great perfection. Palestine with proper culture, might produce every fruit the world produces in the utmost perfection ; for Jericho and the low parts of the valley of the Jordan, enjoy a tropical climate. There the mango and the mammee might grow ; while the Lebanon would yield the finest currants, gooseberries and strawberries, or other fruits of an Alpine or Northern temperate climate. Fruits that are starved in Northern Europe without the most careful culture ; the vine, the olive, the nectarine and the orange, grow like luxuriant weeds in Palestine.

The animals it has been remarked, combine those of temperate and tropical regions. Thus there is a bear, *Ursus Syriacus*, allied to that of Northern Europe, hyænas and jackals of temperate regions, and the *Hyrax Syriacus* or coney, which belongs to a genus of animals, not found in temperate climates.

The ornithology connects Asia, Africa and Europe ; and the birds by their migrations, to these varied countries are significant of THE MISSION to all parts, of the race which was planted in Palestine.

Numerous tribes inhabit Arabia, more or less pure descendants of Shem. In another work we shall endeavour to trace the connexion between the tribes at present inhabiting Arabia, with various heads of families mentioned in Genesis. But in our rough and superficial view of the subject at present, we must consider the whole as Arabs, whether descended from Cush, Keturah or Ishmael. The description given of the various tribes of Arabs differs considerably. They vary in complexion; the brown darkened greatly by sunburning is the most common; but black and yellow likewise are found. They are a wiry, muscular, spare people, with high noses; and are full of fire and life, especially those who inhabit the desert. Their physical frames are particularly well proportioned; hence the great age to which men of some of the tribes, are said to arrive. Arabia is one of the driest regions on earth, and only a small portion of it is fertile. The high table land of the interior doubtless assists in promoting longevity. The race of Arabs is a superior one morally, intellectually and physically as contrasted with the nations who inhabit many regions of the Earth. The deficiency of rivers in Arabia greatly hinders the cultivation of the soil, which is rendered impossible in many parts. This is a great bar to the civilization of Arabia and to the settling of the inhabitants in industrial pursuits. Their civilization like the fertility of their soil, is confined to narrow limits, and does not progress like that of European nations.

The Caucasus is inhabited by a race, whom it is the fashion to consider the type of the so-called "Caucasian race." They vary considerably in physical appearance, some having regular features resembling handsome Europeans; while others, although with a comparatively straight facial angle, have eyes which approach the Mongolic type. The beauty of the race is doubtless much exaggerated, unless when viewed in contrast with Negroes or Mongoles. Most of the tribes inhabiting this region are more or less warlike, and long withstood the power of Russia. They possess great courage and some intelligence. Had they been the superior race they are commonly thought to be, they would not have remained so long barbarous. The same observation may be made with regard to Circassians, as of most other mountain people;—they are split up into small clans, and fight gallantly for their independence.

India is the richest in natural resources of any country of Asia, and might well be independent of all, for necessities and luxuries. The precious metals are not so abundantly found in India as in some countries less rich in organic life. Hence the



A JUNGLE IN INDIA.

tendency of them to gravitate towards the peninsula of Hindostan ; while the lighter spices and manufactures of Hindostan, rush back to fill the vacuum. India is protected on the North by chains of mountains, and on the west by deserts ; while on the East the comparatively inert and unenterprising Indo-Chinese races act as a sand bag, to break the force of any great incursions from the East, of hardier or more warlike Nations.

For ages India has not governed itself. Nations coveting her rich resources, have crossed rivers, deserts and seas, her natural outworks, to scent her sweet breezes and trample on her inhabitants. The nations in Hindostan vary greatly in complexion, as in manners and habits. Black, yellow and white races occur, answering to Mongolians, Ethiopians and Semitic-Europeans, although most, if not all of the nations inhabiting Hindostan, are usually arranged with the Caucasian, which we term the Semitic-European race. The so called aboriginal inhabitants of India, Bhils, Khonds and Santals, occupy the lowest positions in the country. They are of short stature, and inhabit the low hills. Feeding on reptiles and refuse, they contrast greatly with the Brahmins and higher castes, the precepts of whose religion enjoin great scrupulosity in the selection of food ; which is even made a standard of caste. The caste system is one of the most extraordinary ever imposed by Man on himself, and greatly distinguishes India from other lands. It had its origin partly in Sectarian, and partly in Racial distinction. As a general rule, the fairer a race is, the higher the caste. This is particularly the case in the extreme high and low castes ; the Brahmins being mostly yellow or brown, and the Pariahs black. There are exceptions to this, in black Brahmins and white Pariahs. Descendants of Arabs from Arabia and Africa, exist in central India and Concan. The various tribes of India are perhaps in harmony with, its physical character : high mountains and low valleys. The inhabitants have complicated and simple religious systems. The position of India as a peninsula in Asia, is eminently calculated for maritime commerce ; and its inhabitants, next perhaps to the Arabs and Malays are the most inclined to the sea, but little is done in maritime enterprise, compared to what might be, by a nation whose highest castes were not like those of Hindostan, restricted from sea voyages.

CHAPTER III.

A NEW LANGUAGE OF PLANTS.

PLANTS—THREE EMPIRES IN NATURE—THE LOWEST PLANTS—MUSHROOMS—
 FERNS—RUSHES—CEREALS—THE REED AND THE OAK—BULRUSH—ORCHIDS
 —CEDARS—WELLINGTONIA GIGANTEA—THE YEW—ELM—WILLOWS—OAKS
 —HEMP—NIGHTSHADES—ROSE—THISTLE AND SHAMROCK—CHAMOMILE
 —TEASEL—HONEYSUCKLE—PUMPKIN.

PLANTS are Organisms, but not Animals ; and occupy a division in Nature so large, that it has been commonly termed a Kingdom. We believe in *Tri-unity* as an ordinance throughout the Universe. It begins with The TRINITY, and extends lower down to the kingdoms in Nature. The World is a unity, but it has commonly been divided into Three, called, "the mineral, vegetable and animal kingdoms;" which may be reduced to Two. These we are inclined to term the INORGANIC and ORGANIC Empires in Nature. To these Empires we would add another, rendered necessary to give the true position to Moral Beings, who are raised as far above mere organisms as Organisms are raised above Inorganic compounds. The intelligent administrators of law are surely entitled to a separate division, one of a Trinity, to which we give the term MORAL EMPIRE. These three great empires,—the inorganic,—the organic,—and the moral, are the analogues of the body, the soul and the spirit.

But the first and last divisions into which we divide Nature, are admitted compounds of many elements ; and the organic divides itself at once into two sections, that of Vegetables, and that of Animals. The division between the higher plants, and the higher animals is distinctly marked. But the lower subdivisions of each, show a considerable resemblance in their mode of life and propagation. The lowest plants, and the lowest animals, long held a disputed position changing from one kingdom to the other, as ages in scientific discovery rolled on.

The less highly organized or flowerless plants, (Acrogens) which multiply by spores, have no analogy with those animals with a backbone, but the trees, the wood of which possesses concentric rings with pith in the centre, are a true analogue of

the vertebrata. To carry the analogy still farther, the grasses, the palms, and the whole of the rest of the Endogens, typify the higher Invertebrate animals. Plants as a great class typify the animal or corporeal life of man, while the animals illustrate his instincts and passions, exercised in connexion with his body.

The Diatomaceæ, appear to stand lowest amongst plants in the organic kingdom. Their skeletons consist of pure silica, which must be separated from the fluid in which they float, by a most extraordinary process. The lower forms of vegetable life contain more silica than the higher. Thus the horse tails or Equisetaceæ are rich in this substance. Amongst the Endogens the grasses occupy an inferior place, and also contain much of this stony earth. These diatoms have been called brittleworts from their frangibility. Their hard stony skeletons pass unaltered through strong acids, and through furnaces heated to the utmost, without losing their minute markings, which almost defy steel engravings to depict, when made visible by the most powerful microscopes. Carried in the form of fine dust out to sea, they fall in showers on ships. The microscope magnifying these a million fold, displays them in the form of silk winders, spindles, globular bodies studded over with little globes, small-toothed combs, trellis works suitable for the floors of boats, peg tops, Polynesian paddles and shields. The Naviculæ among these atoms, derive their name from their resemblance to little ships. This minute dust so full of life or the remains of life, this scum on the waters, exceeds any amount of which the human mind can conceive. The entire dust of the earth as it appears to the naked eye, would not if enumerated, afford a larger array of figures, than would represent the individuals of these minute atoms. Large figures fail however to convey to the minds of most persons, a due sense of vastness.

These diatoms have long held a disputed place between plants and animals; and are probably the type of the connecting link, between the animal and the Immortal LIFE.

The yeast plant (*Fermentum cervisia*) is one of the simplest of organisms. It consists of a single cell, divided into two parts, the walls of which are composed of cellulose matter, full of an oily substance. It was long doubted whether this was a plant or not; but through that revealer of secrets the microscope, it has been made clear that it is a living organism. When freshly added to the brewer's wort, if the temperature be suitable, germination commences and little buds appear, which in the course of three hours take the form of double ovals, and in eight hours they form marked chains resembling bird's eggs,

as strung together by boys. Some explode, apparently with the effort of birth, and cast about minute dust, which is probably often present in the air, and thus accounts for the fermentations, that appear to take place spontaneously in liquors. In a still later stage these round bodies form branches at divers angles; while in the former they were nearly in a straight line. These plants are among the simplest, yet yield to none in marvellous transformations.

They are a type of those influences ever at work, and ever ready to take advantage of circumstances calculated to increase their power. It is to be feared that there are in every great town, persons who only wait their opportunity, to do the greatest amount of injury to society, and had they the power would not scruple to ruin their nation.

We shall in the chymical view of the human mind refer to the analogy between the different changes and sorts of fermentation and Mental and Moral transmutation. Diseases of the Fungus class, are amongst the most destructive to the plants on which we depend for food. The potato blight, *Botrytis infestans* which likewise attacks its kindred plant the tomato, renders the crops of these two valuable vegetables in some cases total failures. The fairest fruits of agricultural industry, like the precious seeds of a good moral education promise well, the character speaking for itself; for good morals ennoble and elevate. But these growing plants must have a good soil, receive many rays of light from above, and drink in abundance the dews of Heaven. Disease may then appear, but cannot mar the crop. But with a cold damp soil no blessing accrues when the sun shines but feebly on the crop. These fungoid spores, floating in the air like Satanic messengers, plant themselves in situations ready prepared, and are thus the means of destroying or marring and corrupting, what might otherwise be most useful, as long as existent on earth. But this disease not merely corrupts the present generation of crops, it infects the seed; an analogy which may be carried far into the nature of man: for children may be corrupted as well as their parents.

These Fungi take various forms, not merely infesting plants, but birds, insects, fishes and even man. Vegetable parasites are more noxious than the hydra amongst animals; and are said by some writers, to be the cause of cholera, to infest the foul air from sewers, and carry malignant death. Minute though they be and unseen by the ordinary observer, yet they play their parts, and do their evil works, like spirits from the infernal regions. The unenlightened ignore them; but the Microscopist, like "the wise who understand," sees, dreads, and makes his dread known.

The great Fungi of our meadows, heaths and marshes, attain to tree-like proportions when compared with the low plants that infest our bodies or our liquors. Those in Britain alone, are a very numerous class, and grow with greater rapidity than any other division. They rise above the soil in an incredibly short space of time. Those men who in a very little time, rise to importance in the world from a low position in life, have been long compared with mushrooms. To most eyes mushrooms are only of two or three kinds; the good mushrooms (*Agaricus campestris*) and the toadstools; poisonous and indicative in common parlance of an "unhealthy soil." These toadstools are worthless, and are cast away as loathsome rubbish: and are suitable types of those who by foul means rise to wealth and power. The good mushrooms illustrate those who by the development of talent and industry, rise to a position at the best tables.

But we must go farther into detail as popular prejudices are not always in accordance with scientific facts. The number of species of this order in Britain is immense, and there are even more in America. They almost equal the flowering plants of Great Britain in number of species. The flowering plants are a type of those buds and "blossoms" of humanity—the landed gentry, who do not usually spring from the same source as the "mushrooms." When the mushrooms are grown they are admired if they are well flavoured and innocuous, but even when defective in these respects they are interesting objects of study as part of the vast variety of life. In most cases we know little about their remote origin.

Some mushrooms scent the air with the perfume of cinnamon, of apricots, of castor oil, of tallow or of hawthorn; sufficiently emblematic of classes of persons and of the way they have risen. The scent of some mushrooms cannot be borne within doors, while others phosphoresce like brilliant insects; the type of genius: true Genius which is not confined to persons of high birth or refined education. Mushrooms are too much despised by persons in general. They are parasitic on one another. Human "mushrooms" despise each other, and make grimaces at a low origin. Among higher mammalia, when two curs meet, they evidently look down on each other, when they are too well bred to quarrel.

"Cloth of *frieze*, be not too bold,
Though thou art matched with cloth of Gold,
Cloth of *gold*, do not despise,
Though thou art matched with cloth of Frieze."

This motto of Charles Brandon Duke of Suffolk most suitably surrounds his portrait in our House of Lords. And well

does it illustrate the union of the aristocratic and commercial elements in our country; mutually supporting and strengthening each other.

Commerce and manufactures, if they sometimes produce mushrooms in society, rid the country of much corruption and render it more suitable for an advancing civilization. There are many wholesome mushrooms which "authority scowls on, and taste is disgusted with, and fashion is ashamed of" merely because they have never been looked at or their good qualities examined. They are the types of embryo heroes, such as Gray supposed might have been buried in a country churchyard. And we are much obliged to Dr. Badham for "digging the dust enclosed here;" that is to say in the mushroom class, and rescuing from vulgar contempt the choice esculents of an order, unjustly and ignorantly despised. For it is not generally known that a large number of our Fungi are delicious food, rivalling in flavour the choicest viands derived from the animal kingdom. Beefsteaks grow on oaks in the shape of *Fistulina hepatica*, and oysters for sauce, called amongst the mushrooms Hydna. *Agaricus deliciosus* has been compared with lamb's kidneys, and the yellow chanterelle, which has been called the "*Kalon Kagothon*," is as abundant as the vilest toadstools. There is the sweet *Boletus*, the choice *Orcella* and the *Agaricus heterophyllus* which has the flavour of cooked cray fish. The colour of many species is most brilliant. Every shade of the peacock's tail is found in some, in others lovely mauve, Scheele's green, the brightest orange, scarlet or buff, as well as the finest ivory in polish and tint. The lustre of bright metals also,—gold, silver and bronze, decorate this class, which is much less beautiful in form than other plants. Many remind us in shape of an umbrella. Mary Howitt saw a mouse under the shade of a mushroom, feeding in a wood, which she describes in her poem to the wood mouse. All these uses, these resemblances in taste and flavour to objects in artificial life, convey important lessons, as well as enlargement to our minds.

Mushrooms are mostly types of low life. Their form is clumsy, and like the low and less delicate in a population, though sometimes showy in their style of dress, are vulgar in their contour. Our ordinary edible mushroom has a fine flavour, especially when gathered on a high moor. And in the form of that most delicious sauce ketchup is an every day article at our tables. It is cultivated in our cellars, but these have not the delicacy of the field mushroom; significant of the superiority of country bumpkins to the refuse population of towns.

The truffle (*Tuber cibarium*) is subterranean in its mode of growth; sows and dogs, being trained to scrape at the spot in

those beech woods where it is usually found. A fine truffle scents the air with a perfume more stimulative of the appetite of the body than of the soul. It can only be got with the aid of the instincts of the lower animals. Although man is intended to enjoy the fruits of the earth, yet the excessive indulgence of the appetite, which demands such great exertion of low instincts, reminds us of that school of Mohammedan heretics who located the soul in the region of the abdomen.

The bead mould which infects decaying animal and vegetable substances, is of this fungus class, and gathers when a suitable place is found for its growth, without any planting apparent to ordinary eyes. Over bread, and wherever moisture and decay combine, these plants spread with marvellous rapidity; as do the mildew (*Puccina graminis*) and the smut in wheat. Those that attack living substances, feed on their vitals, and bring them down to physical death, are emblems of those sins which "eat as doth a canker," and unless cured, reduce the body as well as the spirit to the lowest ebb. While those that feed on dead substances are like the machinations of evil spirits, which hurt property when they have destroyed life.

This class of plants, spreads at a rate far exceeding what we have examples of, in any other department of creation. Thus the red snow plant, (*Protococcus nivalis*) changes the spotless white snow of some northern countries, to brick red dust in a single night. The lovely and innocent flowers whether in the mineral, vegetable, animal or moral world, can be changed to the deepest dye of guilt by the stains of earth. The purer they originally were, the more easily are their stains seen; corruption being *complete* alike in the simplest substances as in the most complex. The more complex enter with greater facility into new combinations, their decomposition is not so final. When two bodies are combined they are more liable to be stained, but at the same time they can be purified to their original whiteness again; which is less easy with highly complex substances.

Lichens are beautiful objects in their native places, on the tiles of a country cottage, where the house leek and the stone crops blow. The red tile often contrasts beautifully with the green and yellow lichen (*Parmelia*) growing on it; to be faithfully copied in all its pure tints by the Pre-Raphaelite painter. In our orchards we see the apple and pear trees covered with rich coloured plants of this class, which are stolen by the gay goldfinch or chaffinch to decorate nests formed of beautiful moss, which are thus made *en suite* with the tree.

This is the beautiful view of these lichens; but they feed caterpillars and larvæ, they grow where little else will grow,

and form soils on inorganic substances suitable for higher plants. These lichens like other parasites, cannot live where health and purity exist, whether among animals, vegetables or minerals. But disease and death are necessary to progress as things are now constituted. The lichens do not grow in the earth, having leaves and stems in one. They have a strong resemblance to cancers (*Morbus Brightii*), if they are not to be classed together. They vary much in shape and colour. Some are bright and beautiful in hue; and we think how lovely they are, how rich their markings; but yet their shape is grotesque, and suggestive of life in death. They are as injurious to the higher vegetable world, as the lower fungi are to the animal; producing sores on their substance. Healthy young trees are not nearly so subject to their attacks as the old and diseased. The trees in this case are types of man. Some fungi are bright in aspect, being adorned with orange, green, vermilion and scarlet hues, which are not found so purely in most divisions of the vegetable kingdom. These are more easily imitated by the use of mineral colours, many of which are virulent poisons; such as Scheele's green, orpiment (sulphuret of arsenic), chrome yellow (chromate of lead) and the scarlet periodide of mercury. These colours differ from the general tints of vegetation, being hardly ever seen covering an entire plant except among the fungi. The hues of these lichens, which resemble those of our most corrosive colours, illustrate their injurious effect on the plants they infest.

The liverworts (*Marchantiaceæ*) as possessing stalks for their reproductive organs are a more advanced order than the lichens. They are not like them poisonous parasites on living plants. Wherever neglect or solitary gloom exists, there they increase and cover the ground; perhaps choking other plants, but growing where little else will grow; and when they die, they leave a soil behind them enriched, and suited for those lovely flowers that blossom best in the shade.

The scale mosses (*Fungermanniaceæ*), the hair mosses, the screw mosses and the urn mosses (*Bryaceæ*), are all suggestive of objects in common life. They grow diversely in the driest, as well as in the most marshy situations, according to order and species, and are beautiful in form and structure. They multiply by spores; but the scale moss bears considerable resemblance, to such plants as the pearl wort and chick weed. Many of the mosses cover walls where no other plant seems inclined to grow, until the moss first sets the example, giving to the barren stone the verdure of life. Illustrating how to the young fertile mind, no situation can be unproductive of fruit; or is incapable of being developed into a soil, where the bright and lofty can flourish.

The Confervæ form a very humble class of plants, connecting the Plant-animals with the *Algæ*, and are met with at a suitable temperature wherever water stagnates. They resemble little tubes jointed ; and are as fine as thread, multiplying by grains or spores, contained between the joints. The spores of these plants and of those still lower in the Organic Kingdom, require the same combination of circumstances for their perpetuation. The original seed must be sown, often unseen by man, who does not always look with a microscopist's eye, on the hidden birth of those germs which people earth, air, and water. These last are all required, to wake them up to active strides on the ladder of progress.

The *Algæ* are entirely submerged below the surface of the water, whether fluviatile or marine. They propagate in two ways, either by external spores, or from a piece of the interior like one of Adam's ribs. They are very various in form and colorization and illustrate many varieties of terrestrial vegetation.

Sub-marine scenery has an analogy to that on dry land ; but not so close with the dry land of our present earth, as with that of past days, when the Cryptogamia were the principal vegetation of the age. This leads us to consider the types of Ages, backwards when we look at the progress that has been made, and forwards, if we are to take scripture literally, to the period when there shall be "no more sea." Then our present recent seaweeds will only be known as fossils, the historic records of a past age.

The seaweeds also illustrate our manufactures, some being like whipcord, others like leather, and nearly as tough. The stalks of some, form no contemptible substitute for stag's horn. Some resemble elaborate crochet or needle work, while the delicate fronds of a vast number of species, suggest patterns for a great variety of ornamental or decorative work. The *Algæ* are extensively used as food, on those barren islands of the ocean, that produce few higher vegetables suitable for supplying the wants of man. The Carrageen moss and laver are admitted at the best tables, in the most civilized parts of England ; but only on rare occasions. A country must be degraded indeed, when its inhabitants like those of Patagonia and New Zealand, depend principally for food on the Cryptogamia. The colours vary ; almost every shade being represented in the waters, the predominating hues are brown and green, like the tints that prevail on land, amongst the plants of earth. The Cryptogamia as a class, contain the greatest amount of earthy matter of any plants.

The *Algæ*, the most earthy of vegetables, are representative of the bony structure of man, his skeleton, the foundation

of his individual kingdom, the scaffolding on which his muscles and flesh are built. The early stage of man is not in bone, but in pulp, like the beginning of these organisms; his structure has however closer analogies with the more advanced members of this vast vegetable kingdom.

The Charas shew a likeness to the glass worts (*Salicornia*) among the simplest flowering plants; being greatly in advance of the lowest Cryptogamia. They were for a long time classed with the flowering plants.

The earth was clothed with flowers that it might be fit for the habitation of man. Green is the emblem of youth while flowers represent dawning maturity, the type of that age which precedes the time of fruit; the age of greatest importance, but the forerunner of decrepitude and death. These flowers are glorious emblems; they fade, but every spring adds to their beauty, or to that of still more lovely flowers. These Charas are the connecting link between higher and lower classes. They are not in themselves the highest members of their class, having perhaps qualities, which in their own sphere give them but a modest and inferior place. The highest members of a *low* class, be it remembered, are not those that we ought to value most, being themselves often a low class in a high position. "Beggars on horseback" are not the objects we like best to look at.

Most of the ferns and flowerless plants require little sun and much moisture to flourish and ripen seed. The higher the type of plants the more light generally is required which illustrates man's case morally. The more elevated the status of nations or individuals the more they are capable of being illuminated.

The ferns were formerly extolled as medicaments, now they are little valued and even the use of these simples is thought by many to be a relic of a barbarous Age. But the aid of every medicine, is lawful if used in its right place. Therefore the truly enlightened physician, makes use of the lowliest plant, as well as the most deeply buried mineral.

In Ireland, Wales and the least civilized parts of our country, the ferns and Cryptogamia, grow most luxuriantly. We admire their wild beauty and transplant it to the centre of culture. Art should copy Nature, in the lowest as in the highest forms of life; Art should use and diffuse all things, but give the highest its just place.

The Irish fern (*Trichomanes speciosum*) exceeds most of the tribe in beauty, as well as in delicacy. The ferns have well been compared with the fair sex, after whom several species have been named. The Irish fern from its dark colour and

love of a moist climate, may be a type of the Erse beauty. While the lady fern (*Athyrium filix-fœmina*) a more generally distributed plant, is a type of the Saxon girl, who possesses a different character of beauty. The Irish fern and the Irish girl, live in a damp and cloudy climate, while the lady fern and the Saxon, inhabit generally, comparatively dry localities.

The true maiden hair (*Adiantum*) of which a great variety of species clothe the mountain rocks and caves of many parts of the world, is represented in Britain by a little species confined to a few localities in Devonshire, Wales, Scotland and Ireland. It is the most refined looking of all our ferns, and its black stems have been named from their resemblance to the hair of a maiden. It singularly enough grows in Devonshire and Wales, localities where black hair is most abundant.

The passage is abrupt from "maiden hair" to horse hair (*Equisetaceæ*) or horse tails, but the class is an advance on the graceful ferns, the fruit being of a far higher order; reminding us of that of some conifers, which they also resemble in their foliage; while their jointed stems convey to us a faint idea of palms and grasses. The age of this tribe is past. It was that of the Lepidodendrons, of the coal measures, the Kings or the Queens of the order. The horse tails and tree ferns are all the arborescent ferns that are left to us. The horse tails resemble the brushes of the modern chimney sweep; alike attached to a jointed stalk.

The little duck weeds (*Lemna*, N. O. *Pistiaceæ*) that float on our stagnant ditches, are the simplest forms of our flowering plants. The stalk and leaf are united, and the flowers are in a slit at the edge. The root is a simple, straight, white thread. They have been classed with the Cryptogamia, as their organization is so much lower than that of the higher flowering plants. These little duck weeds, illustrate the infancy of an individual, of an upper class in society. They are higher in status than the highest members of lower classes, but are *inferior* to the higher members of lower classes in capacity and power. They however commence an upper class.

Rushes are seldom found except in marshy places; they are troublesome to the agriculturist who may try to extirpate them by weeding or rooting up; but unless he remove the cause of their growth, the moisture that makes the soil rank and fit for such weeds, he spends his labour in vain. The source of stagnation must be dug into, that the water that lies low may be allowed to fall lower, and run away into the depths of the earth. In the moral world a similar change of circumstances is required. The dew of Heaven, and the sun from Heaven call into activity germs of life both good and

evil. Rushes are not in themselves types of anything that is positively evil in their own place; but in the wrong place there are few plants more hurtful. Low social life transplanted to higher is revolting. The "handmaid that was heir unto" or usurped authority over her mistress was in this odious position.

In earlier times, rushes were the chief candlewicks known, to our rural population; the chief aid in assisting the consumption of tallow, and of enlightening cottages when gas was unknown. They are still used in villages, behind the progress of the age. Their light was feeble, flickering and uncertain, but cheering to the gloomy hovel, lit only by the glowing ember. Such illustrates the state of the rural districts in the middle ages, viewed through *the moralist's spectacles*. The bonfires at Smithfield, "acts of faith," diffused a glow through the entire moral circulation which while it roasted and scorched, chased the cold currents of ignorance and superstition into a corner. We have many successions of lights of greater or less volume and intensity. The glowing embers of primeval light which once blazed brilliantly, were succeeded by a clearer though less powerful "light."

The use of oil, gas, stearine candles, and paraffin for light, are all emblems of progress in knowledge, theological, scientific and universal. But two lights are alone really pure; the one is the "Electric," a direct descent from above. It is known by its purity and colourless character;—the human eye can hardly look at it. The other is the lime light which has a similar dazzling appearance. It is a result of the combination of the pure elements oxygen and hydrogen, in connexion with the earthy lime: a type of a glory truly celestial, taking possession of, and being reflected from the Earth.

The grasses (*Graminaceæ*) are the most important of plants; and the cereals stand first, with wheat at their head. The nations that feed on wheat, (the most perfect food for man) are usually the most highly endowed. In Scripture it is considered as the type of spiritual food "the Bread of Heaven," being compared to "the finest of the wheat." This should be the staff of man's life, but it is advantageous for him, to avail himself of every other substance suitable for his food. The man who would confine himself exclusively to wheat, would be in the same position as regards his physical development, as the moralist, who cultivated too exclusively, a department of theology.

Barley (*Hordeum distichum*), rye (*Secale cereale*) and oats (*Avena sativa*) can be cultivated where wheat will not grow. They also are emblematic of the "Bread of Heaven," as the main food of man in all civilized countries.

Christian missionaries, have taken to the most distant Polynesian islands, "the fruits of Ceres." Thus the savages receive simultaneously, temporal and spiritual blessings. Nearly all these cereals grew in Palestine; the centre from whence also the truth shone, which has been the means of enlightening the world.

Rice (*Oryza sativa*) is the next important of the grasses. In most Eastern countries it is more used than wheat, and may be said to feed half the globe. Rice is not so good a food as wheat, nor so well adapted for the entire support of man. The kernel consists almost entirely of starch, a necessary of life; and that derived from rice, is as suitable for human food as from any other source.

Rice illustrates truth received by the natives of many tropical countries, who but imperfectly take it in and are not nourished by it into such vigorous specimens of humanity as those feeding more generally on wheat. Wheat will grow in most of these countries; and therefore purer, and more perfected food is to be had, for those who will cultivate it. The fruits of all countries have their special merits, but it is in using all, and in abusing none, that our power and influence, as civilized beings depends.

Grasses are seldom poisonous, but the bearded darnel



THE CULTIVATED OAT.

(*Lolium temulentum*) equals in virulence the treacherous families of the hemlock and the nightshade, for its seeds having been ground accidentally with barley have caused death. It is an ally of the rye grass (*L. perenne*), a useful species in our own pastures, showing how what is harmless, approximates to what is noxious. The darnel grows treacherously in the midst of other grasses. It is "the tare" of Scripture which grew among the wheat—like Judas among the Apostles, standing alone, one poisonous weed in the midst of a pure and healthy family.

Reeds bend before every blast, from being very light and thin; yet as their flexibility is distributed throughout their whole length, they do not easily break.

A reed may be compared with a tall graceful girl with a head of pretty hair waving in the breeze, like the flower of this plant. She bends to the touch, and yields herself to the hand that grasps her. The fable is true, the reed can stand the blast, better than the oak. The slender girl often resists the storms of life, better than the stalwart man. She shrinks before every breath of trouble, and tears like abundant dew fall, which appear to refresh rather than exhaust her, for she pours out all her grief in them. We may picture her husband like the rigid oak, long defying the little winds, the mere belchings of the storm of trouble. Like raving Lear he cried, "Blow wind and crack your cheeks."

The commercial tempest first drew from him a laugh, like the wind rattling in the leaves of the oak. As the storm increases, the top branches of the oak begin to wave; but his leaves only rustle the louder, rising into a shriek with the hurricane. At last a crash is heard, a giant brother of the forest has fallen, long as steady as himself. Then another crash and one more great tree falls prostrate to the earth, and in its downward course sweeps some of his own small twigs. And now he stands alone; the trees that kept off the wind from him are gone, and the tempest rages without check upon his head; the four winds vowing vengeance on this stout one, this stiff necked one, pour all their force upon his crown, and split him to his root. His fall almost appals the earth. And now his case is hopeless, his life is passed. Our commercial friend, who does not yield to the storm; who is too proud to bend, must fall. The reed survives the storm, but if dry chilling winds last she withers and dies; but lives long enough to continue her race.

The *Papyrus antiquorum* famous from remote antiquity, has handed down even to our own day, writings and memorials two or three thousand years old. It is more durable than any artificial paper, and was used in strips 14 feet long by 1½ feet broad, and upwards. It grew in Egypt, from which it has been

nearly, if not quite extirpated; significant of the decay of the civilization of ancient days, and of the crumbling monuments, which retain little of the halo that once surrounded such stupendous productions of art. The leaves of many palm trees, are used even in the present day to record passing events, and to hand down great deeds to posterity. The labour of writing on these plants, and on the skins of animals was very great; but the literary monuments of these past ages are perhaps more enduring, than those of our own. In ancient times there were fewer competitors for fame, and therefore more chance of "achieving immortality." Will our writers ever take the place of those of antiquity? "Immortal heirs of universal praise."

The cotton grass (*Eriophorum angustifolium*, N. O. *Cyperaceæ*) is our representative of the cotton of the tropics (*Gossypium vitifolium*). An attempt has been made to turn this little plant of our bogs into calico, but without success. Some ingenious speculators, wishing to see us entirely dependent on our own resources, proposed among other things, that we should grow our own cotton, the "king cotton" that is so much adored; and so the wiseacres searched the bogs. Their ears being stuffed with this cotton they would hear no rational objection to it, until the bubble exploded like gun cotton.

The flowers of the arum are sheathed with a beautiful spathe, that protects a pistil, which from its brittleness and unwieldiness would be easily destroyed before the impregnation by the stamens. The leaves are curled up and gradually unfold in all their beautiful, delicate new, green life. The rustic name "lords and ladies" given to our native species is suggestive of the spathe round the flower, being a type of those *artificial*, as they have been termed, but in reality natural distinctions and protections, that surround the lords and ladies in society.

The bulrush (*Typha latifolia*, N. O. *Typhaceæ*) so abundant in our marshes, reminds us of two common objects: the torch that lights up rustic festivals, and the sponge that cleans the torch of war—the great guns; which alike exist amongst smoke and flame. How different is the life of the quiet bulrush as it waves in its native marsh, until the passer-by stretches out to seize it. In like manner the recruiting sergeant, leads off one of our tall country youths, away from his dull village life to fill the craw of the goddess of discord, whose fatal coveted apple, has conveyed the poison of disorder, into the very blood of man. War is a poison, but the most efficacious medicines are the greatest poisons; proving that nothing is injurious, except in abuse.

The roots of colchicum (*C. autumnale*) and white hellebore (*Veratrum album*) are among our most active agents on the

human body. The flowers are pretty, but the whole plants are acrid, and do not like the nightshade tribe, by a sweet taste, invite the palate. These plants are types of the sworn enemies of men, who do not attempt to conceal their hatred, but by the bitterness shown in the mouth, and by the irritation shown in the throat, evince that they are animated by a deadly venom, such as that of the alkaloids veratrine and colchicine contained in these plants.

The hyacinth (*H. nutans*) is a graceful flower, not of the highest type, but still beautiful. Our own little hyacinth, is small compared with the oriental species. We consider the hyacinth a type of the tall, graceful, elegant woman with magnificent hair, falling in a truly "hyacinthine" manner on her slender neck. She has but little expression, and not that exquisite complexion, which appears to have caught the "hues of the lily and the rose." In early youth alone she is sweet, when in the least faded her power of attraction is lost. This style of beauty attains its greatest perfection under an oriental sun, Georgia and Persia, being the land of these oriental hyacinths, as well as where "hyacinthine locks" attain a great development.

The lilies are of many kinds both white (*Lilium candidum*), orange (*L. bulbiferum*) and yellow, variously spotted and marked. They are particularly abundant in Palestine, Asia Minor, and Persia, from whence they have been brought, and are cultivated in our gardens. The white lily may be taken to represent the family. It is a stately plant, whose fine green leaves, contrast well with its waxy blossoms, and bright yellow stamens: it diffuses around an agreeable fragrance. The lily's form is very graceful. Amongst common flowers it is supposed to stand next to the rose in beauty. These were united as an emblem of our Lord. But the lily of the Song of Solomon is probably the *Polyanthus Narcissus*, while the lily of the valley of Scripture is *L. chalcidonicum*. Cowper in one of his poems compares these flowers to the cheeks of our fairest daughters.

The tulip is a sweet scented flower. When wild it is single and pale yellow; but when cultivated, it assumes almost every colour, and acquires variegated markings, but mostly in the form of longitudinal stripes. The tulip, the hyacinth, and many other plants are immensely enlarged, variegated and altered by cultivation, which the Teutons especially understand. They do not so much desire variety in species, as perfection in individual kinds. They amplify them to the utmost and endeavour to produce the greatest number of minute modifications to be called by the longest and most fantastical names. This is thoroughly characteristic of the Teutonic mind, which delights

in these numerous varieties of the same thing. The happy medium or Celtic-Teutonic mind, while it desires the greatest development of varieties, is equally anxious to secure the largest number of species, genera, orders and classes. This is true wisdom in the acquisition of intellectual, and material wealth.

The snowdrop (*Galanthus nivalis*, N. O. *Amaryllidaceæ*) resembles the snow on which it reposes. The flower beautifully washed with green, which contrasted with its white calyx conveys to our minds hope, of brighter days, even in the coldest season.

The narcissus (*N. poeticus*) of the poets has been celebrated from heroic ages. It has a single flower, which modern civilization has altered to a *polyanthus*, or many flowered variety. A type of the Artificial character of the present age, in which natural productions are forced beyond their ordinary limits, and multiplied many times their original size.

The crocus (*N.O. Iridaceæ*) salutes the spring soon after the snowdrop—and the wreathed incense of its delicate perfume rises as the flowers open, on a fresh dewy morning. There are many species, some of a rich yellow, others fine purple, pure white, or beautifully variegated. The Crocus of Ovid was changed into a flower on account of his impatience in love, and the flower was called after him. Spring flowers are short lived. The heat developed in their bulbs forces them early to court the spring; but like premature love, the blossom is soon blasted, withers and dies.

The orchids (*Orchidaceæ*) are so various and magnificent a tribe, that a whole chapter might be written on them alone. Of all flowers they are the most varied in their illustration of other objects. Thus we have in Britain the bee (*Ophrys apifera*), the fly (*O. muscifera*), the butterfly (*Platanthera chlorantha*), the spider (*O. araneifera*), the bird's nest (*Listera nidus avis*, Hooker) and the frog; and numerous insects, birds and other objects are illustrated in foreign species. We have the man orchis (*Aceras anthropophora*), the lady's tresses, the lady's slippers (*Cypripedium calceolus*), the fool's orchis (*O. Morio*), and even the globe (orchis), in two hemispheres with its meridians, is shown in the twayblade (*Listera ovata*). These resemblances are sufficiently extensive, and on this ground alone, we would place the orchids at the head of flowering plants, from a typical point of view. But the crown of beauty is still to be bestowed on them. It is a glorious crown, more beautiful, and set with more varied gems, than any other it is in the gift of Flora to bestow. Our little orchids are beautiful, but the tropics alone produce those lovely flowers in their greatest development.

The flowering rush (*Butomus umbellatus*), with its long needle-shaped leaves, and its bunch of delicate pink flowers, with their remarkable cluster of pistils, is a British plant of great beauty and interest. Few plants have we looked for more anxiously, and few have refreshed our eyes more when found; for rushes in general have but a sombre flower, with none of the brilliant beauty it possesses. It is very agreeable to find what is lovely and bright, in the midst of what is dull, heavy and dusky; like *one* pretty lass in an ugly family of sisters.

The cedar is a magnificent tree, with which we commence the great class Exogens, and the order of the Conifers. There are two kinds commonly cultivated; the cedar of Lebanon and the Virginian cedar; both unrivalled in their own districts, among those that bear cones. Forests represent great Nations and great Empires, while the largest and finest individual trees, are supposed to be their representatives or monarchs.

The cedars of Lebanon (*Abies cedrus*) looked down from the heights towards the Mediterranean, and those of Anti-Libanus towards Damascus, emblems of the great kingdoms of Syria and Tyre. The Virginian cedar is a type of the "Old dominion."

The cypress (*Cupressus sempervirens*) is a dark gloomy looking tree, much planted in graveyards. It stands erect, not like those that are bowed by grief, but like those who preserve a gloomy stern and mournful aspect. They never change their appearance of gloom; like the Jews, who maintain their sombre expression of countenance, in prosperity as in adversity.

The larch (*Abies larix*) is a gay, light tree, compared with the cedar or the pine. Its young leaves are of an exquisitely fresh colour, as they appear early in the season; more like the fair Saxon youth in its delicacy, than the darker Celt.

"Like leaves on trees, the race of man is found,
Now green in youth, now withering on the ground."

This simile occurred to old Homer, and the analogy between men and trees was acknowledged at even an earlier period; so early as that of the book of Judges (ch. viii.).

The *Wellingtonia gigantea* stands one of the first if not the very first for size, age, and grandeur, amongst the trees of the forest; and in the forests of America that land of great things, and in the most remarkable division of that marvellous land North America, and in the most wonderful district of the dominion of "king Bunkum" California. The great Wellingtonia grows to a vast extent, and being perhaps the largest tree in the world, may typify the future power of the United States. But the timber of this tree, although of so great a bulk, is of little commercial value. A nation's greatness is not



THE WELLINGTONIA GIGANTEA IN ITS NATIVE FOREST.

always in proportion to the size of its territory. The Wellingtonia or as the Yankees call it "Washingtonia," has been called the oldest tree in the world; the age having been computed by the number of concentric rings in the trunk, which are at least Three Thousand. This would carry its youth back to the period of the latter days of the life of Shem, Ham and Japhet; to the cradling of Nineveh; to the time when Babylon was yet in its Baby state; to the period when men's lives were yet like trees; and it is probable that some of the Great Grove, will survive until men live again like trees. It is a wonderful thought that a tree, should be the connecting link, between such opposite points of time.

The slow growing yew (*Taxus baccata*)—the oldest British indigenous tree, lives according to De Candolle, from 1,200 to 2,800 years. The men who live longest, are mostly Long in attaining virility. The yew furnishes wood suitable for bows, and was truly an important tree in the olden time. Its tough wood has a great amount of elasticity like the nation that used it. The "bow" of Joseph "abode in strength," which is highly significant, when considered in connexion with the skill his descendants, displayed in the use of the bow. The old age of the yew is an important type of the great strength of constitution, and of the great age attained by our race.

The willows (*Salix*) are greater favourites with us than the poplars, they are more flexible, and can be turned to a greater variety of useful purposes. Their catkins please us by their soft downy appearance, and faint pleasant smell. The number of willows in Britain is immense as regards species, exceeding every other class of our trees. Willows are mostly low in height, and may be "gathered by any hand," but are yet tough, and difficult to break. There are many sorts of willows. There are "*weeping*" willows" on which widows may hang their caps instead of their harps, and there are the willows of which traps are made for the capture of "cock sparrows."

The hazel (*Corylus avellana*), is a plant of much omen, the "divining rod" being a forked branch of this tree. The properties of the tree are very significant; its toughness and endurance, are possessed in common by witches; who stood an enormous amount of pricking without yielding. Its fruit is a type of the results of incantation—"the nuts to crack" for the incredulous.

The oak (*Quercus pedunculata* and *Q. sessiliflora*) our national tree is an emblem of British stoutheadedness and of the British constitution; which like the tree has continued longer than most of its fellows. Trees are emblems of nations. The yew, the oldest of European trees, represents the antiquity of

the Celtic nations of Europe, which is of the date of 2,000 years and upwards,—the very age the yew tree attains. The oak among the Romans was sacred to Jupiter, and being the most famous of the indigenous trees of Europe, let us for a moment consider it, as a type of the Roman Empire.

That sweet voice of the grove, the nightingale, builds its nest at the roots of oak trees, with oak leaves, and its song rises on the suppressed breeze to heaven like the flight of the rapt soul. The purple emperor (*Apatura iris*) rules the insects of the oak, and is Cæsar's emblem; he eats many of the oak leaves, but still the prestige of his name, and the gorgeous lustre of his plumes, cause the greatest admiration for him. The oak gall is occasioned by the puncture of a little hymenopterous insect. It is an excrescence, yet most useful to society. What can be more bitter than gall or than the anger of a Gaul? The irruption of the Gauls on the Roman Oak marred the beauty of the tree, while it added to its utility. Without galls there would be no ink, and no satires "dipped in gall" could be written.

Tannin one of the most important contents of these excrescences, is astringent; the most powerful in general use having a binding influence on the body of man. This the great nation of Gauls exercises in Europe. And why?—because their astringency causes them to be dreaded. It is a matter of fact that the strongest astringents, have sometimes a contrary effect in very large doses. They bind more tightly than the frame can bear; so it gives way with an explosion. The little cynip that occasions these galls, illustrates the development of the Empire of the Franks.

Cradled in obscurity,
When developed to maturity,
Flies forth to colonize.

The oak apple so much sought for in May, to commemorate the residence of Charles the Second in the oak, may illustrate British progress and colonization. Bees place their stores of wax and honey in the hollow oak, whose hard walls preserve them from the spoiler; just as the "wooden walls" of England, throw their strong shields, around her commercial and peaceful industries. The oak has other insect residents. There is the purple hair streak (*Thecla quercus*) amongst the butterflies, which by its hues reminds us of the emperor; and it is an emperor in a small way, being difficult to catch or subdue. If the purple emperor was a type of Cæsar, so this little hair streak is that of the imitators of Cæsar, who resided in the Roman empire. Such were Charlemagne,—Charles V.,—Napoleon I.

The young leaves of the oak are of an exquisite pink brown colour, reminding us of the tint of new-born babes. As the leaves expand, they go through the light virgin tints of youth; deepen into the strong green of *maturity*; the olive of *middle life* and the brown of *decay*. Those plants which shed their leaves; from Homer's days to our time, have been the type of rejuvenescence. The common acorns were the food of the ancient Britons, and those of some species are almost equal to chestnuts in flavour. They are protected by delicate cups, which make them among the most beautiful and finished seeds in nature. There is about them a simple beauty, a rustic elegance, which surpasses the most brilliant tints, unaccompanied by an elegant form.

The oak tree confers great benefits on man. It exercises, as he contemplates it many faculties, of his mind, and supplies many wants. Its bark tans his leather; its galls are necessary for his ink; its timber is the "prop of his house;" and it supports the roof, "vocal with his Maker's praise." With the oak he grooves the waves, and ventures on the treacherous sea; and he sleeps in an oak coffin. The acorn cup *full and overflowing*, sums up the oak's utility.

The mulberry (*Morus*) next to the vine is the most important of fruit trees. Not that it contributes more than most fruits to feed our appetite, but that its leaves feed the silk worm. The fruit of the black mulberry is choicest to the taste; yet the silk worms will not thrive upon its leaves. The white mulberry whose fruit is poor, feeds them best. Those trees whose leaves are taken to feed the worms, scarcely bear any fruit. And so it is with man. If part of the food that should feed his *trunk* is taken away he cannot bear the fruit he ought.

The fig (*Ficus carica*) in its native climates bears at most seasons of the year. The *Bôcor* or early ripe figs are mentioned in Jeremiah xxiv. 22 as the best; so they were compared with those who had the best place among the captives of Judah, who were carried into the land of the Chaldeans to be preserved; while the "evil figs" mentioned in the same chapter are the *Karmouse* or the summer figs, which from being frequently over ripe, will not bear transportation, but must be eaten on the spot—types of the slaughtered Jews.

Figs being so nutritious and supporting, are a type of what the Israelites should have been—the means of nourishing the whole world. The figs of Syria still show this power, by being carried into every country as food, and obtaining a preference over most dried fruits. The barren fig tree of the New Testament, like the green hypocrite, spread his leaves, showing that

he was in full health and vigour to bear fruit, but would not. These leaves were only a cloak, to cover his naked branches. Adam hid his shame with fig leaves in the same manner; he had not brought forth fruit that could be accepted by his Lord, any more than the barren fig tree, bore what could please "the Last Adam."

The hemp (*Cannabis sativa*) is one of the most important of plants, being applicable to an immense variety of textile purposes. To the making of sails for ships and windmills; for tents, cordage, nets, and twine, with their many uses. The natives of India smoke the leaves of the hemp, which are more intoxicating than tobacco, and the practice is difficult to get rid of when once acquired.

Most habits are difficult to break; they require to be cut by the sharp edge of moral feeling. Hempen cords can be easily cut; but if large and powerful they are difficult to break. They hold us by the neck until we are dead; and even when small they can catch us in a net from which we cannot escape. A stronger mind like a hempen cord may carry us over "seas of adversity," or through the Windmill of Passion, which may grind our very bones to dust. Some extraneous power can alone deliver us from this "Hempie" (Scotch), this otherwise unconquerable "She."

The nettle (*Urtica*) is a virulent plant. When it comes in contact with a delicate skin, its minute hairs produce inflammation. If you touch it gently you are stung; but if you *boldly* seize it, you are not. Which affords a moral lesson as to the means of treating the cowardly, the treacherous and the venomous amongst men. The nettle is a good ingredient in soup, its poisonous properties having been destroyed by the boiling water. This is but another proof that things are never poisonous unless wrongly used; and that those which are most venomous, may be made sometimes nourishing and wholesome.

Box (*Buxus sempervirens*) is a tree of slow growth, and as a usual accompaniment grows to a Great age. The wood is very durable and is invaluable to engravers. Its leaves being evergreen and the wood almost defying decay, are very significant emblems of immortality. No leaf lasts longer green.

The spurge (N.O. EUPHORBIACEÆ) is of a poisonous family as this phrase is popularly understood, but our British species are small and insignificant. When the leaves or stalks of the spurge are broken, they are seen to be full of milky juice. This sham-milk, like that of most milk yielding plants, is acrid and poisonous. Milk being a type of wholesome food, this is significant of poison offered in the form of nutriment;—most human poisoners, use a mask. These plants are of little ordinary

value in our country, but were formerly used in medicine. The very name "spurge" is but a slight improvement on purge.

The spurges do not attain arborescent dimensions in this country, but in Africa they grow to the size of trees, both in the tropical and southern regions, where they are largely used for poisoning man and beast. The poison takes effect through the blood, so that arrows dipped in it, are readily available for the destruction of life. A single plant, falling into a pond of water may destroy a whole herd of Zebras (*Livingstone*), while upon man and cattle, it acts merely as a violent cathartic. These plants are types of witchcraft or incantation, which in Africa they are used to punish.

The broom rape (*Orobanche* that is *vetch strangler*) is parasitic on the roots of plants, not being able to grow in any other manner. It has no leaves to draw sustenance from the air, which partly explains its parasitic character. Plants have their parasites as well as man and animals; those on the latter, are usually of a lower class than themselves. But here we have a plant, wanting some resources of ordinary vegetation; yet as regards its flowers and seed, not behind many self-supporting orders. Such is the case with some men not otherwise contemptible; but who are obliged to play the part of sycophants, not being able apparently, to exist on an independent footing. If the protecting plant be *weak*, this parasite may destroy it. A man of fortune as often loses his substance through an idle and worthless companion.

The thorn apple (*Datura stramonium*) is of the poisonous family of nightshades. Taken in large doses into the human body, it produces vertigo and madness; sometimes permanent. It is a powerful narcotic; but most narcotics have a twofold action. In small doses they stimulate; in large doses they intoxicate. This shows great analogy to the effect of undue excitements on the mind, or unnatural and unhealthy pleasures. The mind feeling lassitude; a craving vacancy unfilled by its reserved force, seeks for what are usually called "stimulants." These producing a temporary excitement, are followed by still greater depression. A stronger stimulant is taken, a narcotic, producing tenfold lassitude, weaving a misty net over the mind. Such is the result of devouring mental food that stimulates and morbidly excites the feelings and lower propensities, producing at the same time, a deadening effect on the moral sentiments. How different is the influence of fresh objects, well worked into the mind, reduced into its very substance, to form the foundation of what is new, true, and healthy in growth. This is real progress to perfection in

what is good, as opposed to retrogression—the utter marring and corruption of the moral nature.—The last stage is madness.

The deadly nightshade (*Atropa belladonna*) is a dark sombre looking plant, bearing livid, purple flowers, inspiring admiration and dread. The berries resemble small, wild, black cherries, one of which has caused the death of two persons; for it contains the deadly alkaloid atropine. True to its name, the “Belladonna” is a type of a beautiful lady. The physiognomist, discerns her character at once, and hardly needs to be told that she has slain two men, with those black eyes. The belladonna is a valuable medicine amongst homeopaths, with whom “similars are cured by similars;” which explains how it is, that he whose happiness is *poisoned* by the venom of one beautiful lady, is entirely cured by the healing virtues of another. This belladonna acts greatly on the eyes, producing in them a tendency to roll and languish. Belladonna occasions a dilatation of the pupil of the eye; which is followed by gasping and violent palpitation. A similar change comes over the eyes and heart of the *pupil*—in love when he has found a *mistress*; he succumbs,—a slave of Belladonna.

The woody nightshade or “bitter sweet” (*Solanum dulcamara*) is rightly named in Latin, as well as in English, its flowers are of a beautiful purple, and its berries slightly resemble red currants. Ignorant children have eaten them in mistake, and thus met their death. The berries are first bitter in the mouth, but sweet afterwards;—a type of trial rightly taken.—As such it is a most useful medicine; while it is the means of death if trifled with. In this plant the bitter comes first, and then the sweet, which is better than the sweet first, and the bitter afterwards.

The potato (*Solanum tuberosum*) belongs to this deadly class; and some parts of the plant show strong affinities to the nightshades in their poisonous properties. Yet the tubers are the main support of a large number of our population, and are the most wholesome and useful of vegetables, in the limited vocabulary of cooks. But to take the potato as a substitute for any one of the cereals, is a great blunder. The rationale of this is simple. Gluten is not contained in the potato, to a sufficient extent to place it in the same category with the “true foods,” on which man can perfectly thrive alone. This is partly explained by the potato belonging to the class it does; being of a very small band of *wholesome* brothers in a poisonous order. A sort of Lot family in Sodom; or a little Abijam in the house of Jeroboam.—The *Solanum Sodomeum*, is one of the poisonous plants of this family. The shoots of potatoes are not wholesome; neither

are the stalks, leaves or apples; significant of the division to which they belong, and of their bad properties. Those that spring from the potato, as well as those from which it sprung, are alike deleterious; although it is in itself good, if well cooked.

Those strongly scented herbs which perfume gravies, and china jars, mostly belong to the gaping labiate class (*Lamiaceæ*). The flowers by their shape remind us of tongues; and surely they act as powerfully on our tongues, as on our sense of smell. Some of them resemble in odour the least pleasant animal secretions, which the apothecary by mixing with other ingredients turns into the most delicious perfumes. Since the middle ages these plants have been moral emblems. Thus mint, is a type of virtue, sage of wisdom, thyme of longevity, its odour being so permanent; rosemary of invigorating fragrance, and lavender of enduring modest worth, that is always pleasant, and can hardly be too strong.

The convolvulus (N. O. *Convolvulaceæ*) belongs to an exquisitely graceful family, not excelled in beauty by any class of plants. They creep or climb with an easy, negligent air, put forth their lovely delicate flowers as the sun shines, to close at even. They never can rise alone, but must cling to some object, and bind what they seize on, with their net of corded stems.

The convolvulus tribe is typical of that class of women that cannot get on alone, but who embrace their supports, and form wreaths that envelop and encumber. They are difficult to shake off or get rid of, may be torn and crushed, but have like the convolvulus a vitality well nigh inexhaustible. Thus some women will endure a great amount of ill usage from their harsh male relatives, and yet still cling with affection to them.

Scammony (*Convolvulus scammonia*) is a well known purgative resin, derived from a plant of this order; it has all the climbing tendencies of its kindred. It reminds one, of those who by their violent conduct, reduce those who support them, to a "shadow of their former selves," which is the effect of an overdose of this drug.

The gentian (*Gentiana lutea*) is reckoned a good stomachic and fine tonic, by those who believe in *tonics*, or in the good action of bodies in the stomach of man—that have no place there. The stomach is a private workshop, into which from its peculiar constitution and construction, no object should be admitted, "EXCEPT ON BUSINESS;" if it is to be a well ordered division of the human body. Raw material for the supply of the great factory, may be brought in, fuel for its furnaces, grease for its machinery, and various chymicals may be ad-

mitted; but no mending is allowed on the establishment. Everything must be made NEW. Human life can only be maintained by allowing the living organism, *to arrange itself*. It is this power that constitutes useful medicinal agents, that of modifying the action of particular parts of the body, so as to allow of the increased action of others. We must remember however, that it is with the body as a *whole*, that we have to do. Remedies such as gentian, are on this ground fading from view, in the prescriptions of modern physicians.

The primrose (*Primula acaulis*) whose delicate sulphur coloured blossoms, are the flowers most sought for in our childish days, are our first loves among the flowers; and perhaps the types of our first loves among the maidens. So sweet, so fresh, we press them to our lips although a tear of dew is on their eye; the tear which accompanies spring; the ornament of living blossoms, soon perhaps to perish.

“The rath primrose that forsaken dies.”

The heath (*Ericaceæ*) is an order of plants, that covers vast tracts of country in the northern parts of Europe, and great districts in Africa. Even those that grow in bogs, have very little succulence. There is a great regularity about their mode of growth, and they with difficulty wither. The flowers are beautifully delicate, and when in full bloom on a Scotch moor, intermixed with yellow broom, they form a charming picture, both for man and bees, which enliven the still landscape, by their ceaseless hum. Heaths grow where many other plants will not, and form the main food of some of the grouse tribe. They are a type of useful industrious races, who are very *poor* in themselves, but manage to produce what is of great value, in proportion to climate and soil.

Dandelion (*Taraxacum dens-leonis*) is a composite flower, being made up of a variety of florets. Its blossoms are a rich solar yellow, and its seeds are furnished with a winged pappus, which enables them to fly to districts, that could hardly otherwise be reached. Evil inclinations are as difficult to extirpate and subdue as this plant, and are gifted as it were with *winged seeds*, which carry them over the Earth. The dandelions call for great exertion, on the part of those who would confine them to their proper limits. Most weeds are a type of those evil inclinations and passions so difficult to subdue, as contrasted with the “cardinal virtues” which like more tender blossoms, require the utmost art of skilful cultivators.

The thistle family presents to our view, lovely flowers of “imperial purple” or snowy purity; yet are furnished with such a set of formidable thorns, that it is unsafe to meddle with

them, without a more powerful weapon than man's unaided hand.

The Scotch chose the thistle as their emblem, thinking it perhaps a type of their nation, for both are unsafe to handle; both show much beauty, both are very *hardy*, growing everywhere, and cannot be extirpated, but are not everywhere "a

weed." In some countries Scotch thistles, are potted and petted as curiosities. The English chose the rose as their emblem, and suitably it represents English society, which has gathered around itself such beautiful partners, as the typical thistle and shamrock. It has been called the Queen of flowers, as an English maiden is the Queen of her Sex. These typical "flowers" are composed of the choicest elements of the three nationalities. Such are the English, Scottish and Irish maidens, "the three graces" of the United Kingdom.

The common chamomile, the species usually cultivated



COMMON CHAMOMILE, ANTHEMIS NOBILIS.

for medicinal purposes has been celebrated for ages. It is another example of the composite order.

The sunflower (*Helianthus annuus*) turns towards the Great Centre of our system, as often as the season of its bloom comes round. It points towards heaven, and is a type of those who in an especial manner, are reflectors of celestial light; who *turn* towards it, follow it strictly in its course and enjoy special blessing in consequence.

The teasel (*Dipsacus fullonum*) is a very useful plant being necessary to the combing or teasing out of cloth, for which no fitting substitute capable of "raising the nap," can be found by the fullers. The hooks of the calyx are very penetrating. They remind us of those characters in society, who make our hair stand on end with mental electricity, which assists however in promoting the *circulation*, and clearing us of much extraneous matter, that cannot be otherwise got rid of; clinging about our minds and entangling our ideas. In the process of weaving cloth an extensive structure is got together; but one requiring polishing and combing, to fit it for useful purposes.

The honeysuckle (*Caprifolium*) is a plant that the bees love. If asked "where the bee sucks"? we might say, "In the honeysuckle;" one of the plants which give to our garden honey its choicest flavour. It cannot stand alone; it requires the support of brambles, or of any stouter plant that happens to be near, to shelter it. Each flower resembles a beautiful vase or horn finely curved at the bottom, enclosing a nectary fit for Flora's own lips. A true cornucopia, ready to pour out the sweetest fragrance, to the air, or honey to the taste.

Some of the cucumber family are poisonous; and others are eatable, but unsuitable to form a large portion of human food; like the potato and tomato, which belong to another class, where many poisonous plants are also found. Those who belong to a *bad* family, are not to be so thoroughly trusted as others.

The pumpkins exceed in size the fruit of all other plants. They are types of great empires of rapid growth, which *last* but a short time, have little substance; but are as "flatulent" in the moral world as these vegetables are in the physical. Expanded to an enormous size themselves, they have no understanding of anything that is more compact or less windy. Pumpkins grow best in America.

CHAPTER IV.

A NEW LANGUAGE OF PLANTS.—*Continued.*

VINES—UMBELLIFERS—PEAR—CLOVER—FLAX—WOOL—SILK—OPIUM—ALOE
 —BAOBAB—BANYAN—MANGO—CAOUTCHOUC—SUGAR—BAMBOO—MAHO-
 GANY—PALMS—AGRICULTURE AND HORTICULTURE.

THE ivy (*Hedera helix*) is evergreen, and survives to an immense age, perhaps longer than any other climbing plant of Europe. Most creeping plants have graceful leaves. With these the ivy is doubly furnished, having a light and rich dark green foliage. It is a bitter and unwholesome shrub; but its blossoms have a rich smell, and attract numerous insects in the late autumn, when other flowers are withered. The ivy loves to climb walls or large trees, doing great injury to both, but giving them a green picturesque appearance. It assists the decay of the trees, decomposes the mortar, and helps by its spreading branches, which grow into the stone, to reduce many a noble pile to a ruin.

The true vine (*Vitis vinifera*) is amongst the most valuable of plants; its leaves are so graceful, its tendrils are so entwining, its fruit is so delicious; and unlike the ivy it harbours few insects and reptiles. The vine is a type of a fruitful, good and useful woman, the ivy that of a graceful daughter of Bacchus, who exercises over many men a fascination, not to be easily shaken off. Numerous birds make their nests in the boughs; numerous insects reside under the shadow of the ivy; the type of the vices Bacchante shelters. The whole growth of the ivy and that of the population it protects, tend to corruption and decay, but this very decay cheers our sight, by reminding us of what is past; and by contrast with surrounding objects, shows that progress has been made.

The umbelliferous plants are mostly poisonous, but yet some are amongst our most valuable vegetables. Thus we have the carrot (*Daucus sativa*), the parsnip (*Pastinaca sativa*), the anise (*Pimpinella anisum*), the parsley (*Petroselinum sativum*), the celery (*Apium graveolens*), amongst wholesome plants; while we have the hemlock (*Conium maculatum*), fool's parsley (*Are-*

thusa cynapium), water drop wort (*Enanthe crocata*), and the water hemlock (*Cicuta virosa*) among the poisonous plants. Many of these have a superficial resemblance to each other, but can be at once distinguished by their fruit. Thus what is wholesome and noxious may be sometimes confused; but the distinctions are in reality widely drawn; the trained eye can detect them. "YE SHALL KNOW THEM BY THEIR FRUITS."

The cherry (*Cerasus communis*), the laurel (*C. Lauro-cerasus*), and the Portugal laurel (*C. Lusitanica*), all contain prussic acid, either in leaves, flowers or kernels; which gives to them a portion of their rich flavour; but at the same time, renders them the *trustees* of poison.—A gift liable to abuse.

The shape of the fruit of the pear is typical, and is often given as an illustration of form. A round drop is a little world, and as it remains attached to some corner of the great world, it is a hemisphere, but when ready to fall, it assumes a *pear-like* form, and descends from its parent sphere. The fall is great, but the new shape is more in harmony with its transitory condition: it becomes a perfect sphere the next second. These differences of form illustrate stages of progress. The metamorphosis of form illustrates growth and development.

The strawberry (*Fragaria vesca*) grows nearest the ground of any of our fine fruits, creeping and trailing along the surface. It is perhaps the most wholesome of fruits, and the most easily gathered by children. The tallest of us must bend to pick up jewels, and the taller we are, the greater is our descent. The fruits of the earth are not fine, in proportion to the loftiness of their growth. The strawberry surpasses many high trees in the quality of its fruit, but we must stoop like children to gather it. We must bow our heads even to the dust, if we would be refreshed by its juice.

The gooseberry (*Ribes grossularia*) is protected by prickles and has rather a tough skin. This is a little surprising, when we see naked fruits like the strawberry without any, which yet are apparently of more value, as objects of beauty, flavour, and food. We ask the reason of this, and find that this double provision, made for its protection; is that this coarse fruit is intended to supply some *necessary* in the world's economy. That great want being of wholesome vegetable acids, such as the malic and citric, which abound in the gooseberry. Strawberries could not supply this want, and are therefore not thus doubly protected. In morals the indispensable is fenced round with extraordinary armour.

Cows, sheep, horses and pigs, are said to live well when they "live on clover." It is food however of a highly stimulating and exciting kind, extremely flatulent, causing death by a sort

of explosion, in cattle which eat too freely of it. Food of the most nourishing and stimulating character, is not the best for animals, or man. In morals, when one has been *underfed*, too free a use of rich food is destructive of *life or reason*. A mental apoplexy may follow a mental starvation.

Although natives of China and Hindostan, the orange family have been dispersed over most parts of the earth. Oranges are of the same shape as our globe, and the citron and lemon by their form, illustrate its orbit. The orange was perhaps the golden apple kept in the garden of the Hesperides; to obtain which was one of the labours of Hercules, who desired universal dominion. The orange being so nearly the shape of the world would favour the idea of its being referred to in classic mythology. A species of orange has been called "the forbidden fruit," a significant name.

"Solomon in all his glory, was not arrayed in vestures," equal in brightness to the petals of the geraniums. Not even the dyes refined by the culminating chymistry of ages, can produce, or rather apply tints like these; for the effect of colours more consists in their application than in their principles. The imitation of geraniums in paper or wax is a failure. The lilies of Solomon can be successfully imitated by modern art, but not the geraniums of our day. A century ago they were confined to the gardens of princes or nobles, and as rare as Tyrian dyes; but now finer flowers grow in cottage gardens, than fifty years ago, were known in the choicest greenhouses of our palaces. A similar change has come over the art of dyeing. Finer hues of imperial purple, scarlet and orange, than ever adorned Augustus or Livia, now decorate penniless village beauties.

The fibre of flax (*Linum usitatissimum*) is very strong; but is much stronger *before*, than after it is bleached: which rule applies to many substances. Sugar has a stronger taste before being refined, than after; although in reality, it contains rather less saccharine matter. The polished man whose blood has been much refined for several generations, has less physical strength than a rough, as it were unbleached rustic. For rough hard work, the bone and muscle, of "the son of rude toil" is preferred, but where toughness and balance of frame are required, the gentleman can endure the longest. Fine spun linen, from the close twist of its fibre glides smoothly over obstacles and corners, which would catch and wear out the rougher cloth. If too finely spun however, the linen is only fit for very fine purposes; and so our doubly refined men cannot bear what is rough.

Flax is eminently illustrative of the restless, enterprising, "individual" labourer, full of energy in everything he does.

Every part of the flax is full of strong tough fibre, which also illustrates the powerful muscular system of European nations, as contrasted with that of the natives of tropical or sub-tropical regions, where the cotton (*Gossypium vitifolium*) is grown. Like the cotton plant, a very small portion of what the natives of hot countries produce is *profitable*: their labour is not profitable in proportion to its expenditure. Flax is a much longer, but harsher fibre; unlike the cotton of the south it has not a warm, downy, sensual feeling, to the touch.

Wool and silk, are the great productions of the animal kingdom, as contrasted with the linen and cotton of the vegetable world, in their application to the clothing and wants of man. Wool answers to cotton, as the warmer of the two, but silk answers to cotton, as mostly the production of hot climates. Wool being the worst conductor of heat, is the best for external garments in cold regions. Wool and flax, are the national clothing of northern civilized nations, and forcibly illustrate their character. Northern nations, possess both the original dirtiness, and artificial cleanliness of flax; a type of the progress of those nations in civilization. Cotton, originally of the purest white, receives every stain. It is a fibre ready for use, while flax has to be cleaned and separated. The cotton fibre passes from a pure, to an impure state; illustrative of southern progress in impurity. Wool is a type of the non-conducting character of the Teutons, who receive impressions with great difficulty, yet long retain them. The Teutons are the great woollen manufacturers of the world.

The sweet-scented violet (*Viola odorata*) is loved by all. Its blossoms are nearly hid in its heart-shaped leaves, which appear first, like those who offer their whole hearts, and their gifts afterwards. Violets are far too sweet to be trampled on, but invite us to stoop down and pluck them. The violet's hue is not of an imperial purple; not the type of those allied to royal blood, but of modest and retiring worth.

The heartsease (*Viola tricolor*) is magnificently coloured, purple and yellow being the prevailing hues. The mind sighs for dominion illustrated by purple; for immortal light illustrated by yellow, approaching that of gold. When it gets these,—the colours of this flower; it finds, "Heart's Ease."

Mustard (*Sinapis nigra*) is the most biting and pungent of our spices, and is an indispensable accompaniment of our national roast beef; which will not even go down properly without this addition. John Bull is fond of what is juicy and rich, which however like a good joke, must have a slight flavour of sarcasm to be thoroughly and generally appreciated.

Opium has as soporific an effect on the conscience of those

engaged in its traffic, as the drug has on the minds of those who partake of it. Both forget its evil effects. Those who advocate opium eating, dwell much on its advantages as a deadener of pain. It may alleviate Homeopathic doses of pain; but it may in turn produce Allopathic doses of misery. The dreams of those under the intoxicating influence of opium are delightful; and are said to resemble visions of Paradise. But as the mind awakes, tortures of the most fearful kind succeed. Greater horror steals over the mind, than most men have conceived, or dreamed of in this world. Under its influence, Death is not dreaded; and if the wretched sufferer cannot be gratified by another dose, he often feels inclined to Self-Destruction.

Opium has its use, being one of the most effectual narcotics, and in minute doses, it is a soother of the nerves, without a narcotic effect. Poppy seed has no sedative property; the oil in the East being used as a substitute for salad oil in cookery; and the refuse of the seed when the oil is pressed out is very effectual in fattening poultry. The seeds surrounded by the narcotic poppy head, are a type of death and resurrection; but of that resurrection followed by a second death. The corn poppy is our common example of the genus *PAPAVERACEÆ*; it is similar to yet much milder in its narcotic effects than the white poppy. The inhabitants of India, China and Turkey, are much more addicted to the use of opium than we are, and have a more powerful plant to use as a medicament.

The *Agave Americanus* or American aloe, spreads to the extent of 20 feet, and bears a flower stalk 18 or 20 feet in height, resembling a pole on which a series of little lamps are hung. In Mexico, it plays an important part in the domestic economy of the natives. The juice is fermented and becomes a wine,—the "*pulque*" of the Mexicans, by them preferred to all other intoxicating liquors. The removal of the juice just before the flowering, causes the death of the plant, which can only yield it, when it has attained the age of fifteen years.

A young man may live quietly all his boyhood; yet fall a victim to a love of drink, in the *flower* of his age. Mexicans attain their adolescence at FIFTEEN years.

Africa is the stronghold of aloes. The Birman empire furnishes the "lign aloes" (*Agallochum*), and East Africa and its islands, yield the plants which supply us, with that gum resin the Socotrine aloes. These grotesque, rugged, gloomy trees, with their immense flowers, remind us of the development savage life receives in these countries, contrasted with the civilization of Europe—typified by the delicate character we recognize in European lilies.

The cacti (N. O. CACTACEÆ) are a stiff, unyielding class of plants, and remind us much of corals amongst zoophytes ; or



MEXICAN PLANTS.

Aloe. Agave. Mecal Cactus. Melo Cactus. Cactus, or Gaus.

warts and excrescences on our bodies ; the soil standing for our flesh. Some resemble inanimate objects, such as candelabra ;

others are spined like sea eggs or hedgehogs. Out of these grotesque stems, spring magnificent flowers and many yield a pleasant fruit, such as the Indian fig, that feeds the cochineal insect (*Coccus cacti*). The *Cactus melocactus* is protected by formidable thorns, and affords when crushed a juicy pulp, which the driest situations in the hottest summers do not parch; but affords to man and beast, when oppressed with thirst, a delicious refreshment. This is truly "a root out of a dry ground;" yet beset with thorns and prickles which render it dangerous to the careless touch, but those who know its value, can draw sustenance from it even in the desert. A type of the citizen of the future world, who find streams everywhere; even in "a thirsty land." (Compare Psalm lxxxiv. 6.)

These cacti afford the best and most impenetrable hedges, for the protection of fields and gardens, against the visits of stray beasts or robbers. An enemy to one, may be a friend to another.

The Baobab, monkey bread, or Ethiopian sour-gourd tree, is one of the largest in the world, its trunk attaining a diameter of 30 feet. The branches stretch over an enormous expanse, and the hollow trunk is sometimes used as a stable or hut. It is a low spreading tree, not often attaining a greater height than 60 feet. It grows to its full height in 30 years, but continues to expand in girth for a very long period. Thirty years is the limit of man's growth as regards height; after that period he merely spreads. These trees are exceptional in their mode of growth, and are types of the period of man's existence on earth. Adanson calculated that the largest of these trees is at least 5,000 years old. This would certainly exceed the *post Diluvian* Life of Man on Earth, as chronology has already run.

The bread fruit (*Artocarpus incisa*) takes the place of the cereals in the Polynesian islands. It requires cooking, but not the long elaborate process, which grain undergoes, to fit it for man's use.

The natives of Europe have industry as it were forced upon them; such being indispensable to the very existence of a large and dense population. But the inhabitants of tropical regions usually find sustenance with much greater ease; and are therefore not so stimulated to that labour which profits mind and body. Nations, as also classes of society, are honoured in proportion to the work put upon them.

The highest men in the state labour most. The lowest men in the state labour least. This distinction is more inclusive than mere class distinction; for a man may labour like a giant as a day labourer, and a man may labour like a fly as a prince. But the *true* Prince in mind as well as in station, performs the

greatest labour of ALL, and will receive the highest reward. The bread fruit and the plantain, so useful and valuable where they grow, were not we think, prepared as a compliment to the highest order of man. They were given to races, who would hereafter live in the tropics, and who would spurn the labour, allotted to the more industrious children of Adam. The bread fruit was bread from heaven, amply sufficient for the supply of every want, and the type of the gospel as less perfectly received by those Polynesian and African races, than by their more highly gifted Semitic-European brethren.

The mimosas (N. O. LEGUMINOSÆ) or sensitive plants, are most abundant in Brazil, and in those parts of America, where vegetation attains its utmost development. They have an exquisite form and delicate leaves, and are surely amongst the highest vegetable organisms, even in the continent of America. Their feathery leaves surpass in beauty, the acacias of the Old world. If the feathers of the birds of Paradise, are suitable to their high sounding name in the world of birds; surely the graceful flowers of the mimosa, are entitled to a similar place amongst vegetables. This is the last finishing touch, which the Creator has given, to His choicest domain of plants.

One species (*Portiera hydrometrica*) is a natural barometer, indicating by the opening or closing of its leaves, the approach of dry or wet weather; like our beautiful little pimpernel (*Anagallis arvensis*). These heralds of change, are sufficient for the savage or uneducated, but man as he grows in civilization, requires the aid of more delicate artificial instruments—such are more under his control. Had he the same understanding of the construction of the animate indicators, that he has of the inanimate he would find them answer equally well, but he would then understand what life is. Then the variations in the atmosphere, would be clearly seen. Such changes, are types of changes in the Moral world,—for both are affected by analogous agency.

Dracænas or dragon trees, grow to a prodigious size in Africa and the Canary isles, in one case attaining the circumference of 70 feet. They grow in a curious manner. The branches first springing from the root, and then proceeding down to the earth they close round the tree; so that each tree, is in reality a bundle of trunks united.

This mode of growth is suggestive of that of a Nation, which enjoys equal, moral and material advantages. The nation approaches heaven first, by the cultivation of morals; and when it gains moral strength, turns again to earth, like this tree, to draw out of it that sustenance which it affords. The moral elevation of nations, like the material elevation of trees, has a

certain limit. The descending branches of the tree reach the earth in which they take root, and again ascend to bear many more leaves. This upward and downward progress is favourable for the growth of the tree. Moral elevation and material wealth, should accompany each other. The nation of Israel's progress has been, and will be of a similar character to this; *first upward*, and then *downward*; that they may be firmly Rooted in the Holy land. That they may spread and increase in size, and in number of branches; yet all to proceed from one vast trunk. (See 2 Kings xix. 30.)

The banyan (*Ficus indica*, N. O. ARTOCARPACEÆ) is the Great tree of India. Its trunk is large and its height considerable, but its spread far exceeds that of any other known tree. It is in itself a forest, or a colony of trunks; for each great branch, sends down shoots that root themselves, and become to a great extent independent of the parent tree; forming a harmonious society. In time each rooted stem becomes a Trunk, in its turn to become a progenitor of other trunks. Therefore the tree lasts almost for ever. It is the tree whose existence most nearly approaches Immortality; and gives us the best idea of the "Tree of Life."

The pitcher plant (*Nepenthes distillatoria*, N. O. NEPENTHACEÆ) bears at the extremity of its leaves, a jug shaped vessel, which collects water, and when full, a small lid with which it is provided, closes, so that evaporation is effectually prevented. A wonderful adaptation of means to ends. The water is remarkably cool and pure. The pitcher is suspended by a curled tendril, which waves towards the stranger, whether man or monkey, as he moves the bushes in its vicinity; expressively indicating that he should drink. The impure water in hot climates, being rich in *spores* that poison the body, is eminently illustrative of corrupt morals, which "poison the mind." But in every land pure water, can be obtained from pure sources; or foul water can be purified. These little pitchers of wholesome water, resemble those who do good, and live morally in the corrupt atmosphere of India and China. When they acquire knowledge of purity; the moral atmosphere is so dry and unfavourable for its reception, that they feel inclined to shut it up within themselves, but the thoughtful and congenial, who are willing to receive what is pure, come to them and are refreshed.

The Pine apples (N. O. BROMELIACEÆ) are a class of plants peculiar to the tropics. Their flowers are brilliant; their fruit is beautiful in appearance, and far finer in flavour than any other of large size. The great peculiarity of the plant, is that with the exception of a small bundle of leaves, and its root,—

when ripe it is almost all luscious, juicy fruit. It is solitary and unrivalled; it wears a sort of crown below and above. The upper crown is cut off, and planted in the earth; it flowers and bears this choice fruit.

The Pine apple is a lowly plant, illustrative of our Lord in humility. But with all this lowliness, it is acknowledged to be the choicest of fruits. The *spiny crown* on the top, is a type of "the crown of thorns;" while the prickly leaves beneath, are a type of those thorns which beset HIS path on Earth.

The mangosteen (*Garcinia mangostana*, N. O. ANACARDIACEÆ) inhabits the Spice Islands, whence it was brought into India, and other tropical countries. It has a large flower, and bears a fruit of the size of a small orange. The flavour combines that of oranges, raspberries, strawberries and grapes. It has a fine aroma, and is very refreshing. It is one of the choicest fruits in the world, not to be equalled by any tropical fruit, except the pine apple. It grows on a high tree like the citron. The common mangoes belong to this class, and have a rich and beautiful appearance. Few English fruits can be compared with it in beauty. The mangoes are a type of those fine and fleshy natives of India with the hue of Oriental beauty, but having qualities unpleasant to most Europeans. The mangosteen having so much more flavour, and being admired by all, is a type of those natives of a higher caste, who are not so numerous as those of a lower caste, but have more of the refinement and polish of cultivated life.

The calabash tree (*Crescentia cujete*, N. O. CRESCENTIACEÆ) furnishes in the hard shell covering of its fruit, a material out of which cups and bowls are made, similar to those usually formed of pottery ware. Nations of indolent habits, have utensils, as it were almost ready made for them; as well as food requiring little preparation. The fruit of the calabash is of various sizes and shapes, yet full of a nauseous pulp. Suggestive of the impure vessels, of the inhabitants of most tropical countries.

The castor oil shrub (*Ricinus communis*, N. O. EUPHORBIA-CÆ) belongs to a poisonous family. The oil is one of our most gentle purgatives,—yet one of the most nauseous and sickening substances known to the human palate. The oil is expressed from the seeds, and the leaves are among the coolest and pleasantest external applications for headache. The leaves of many plants are useful in this way. We read in Scripture, that the leaves of the "tree of life are to be for the healing of the nations." The gentle *purgative* properties of the castor oil, may typify the means of purification, that should be used with those of weak constitutions which is at best extraneous and

unnatural, but necessary for purifying when the natural process of Moral Assimilation is interrupted. Violent, drastic purgatives such as the Croton oil derived from the *Croton tiglium*, lead to the destruction of the tissue that they are intended to relieve. Their abuse reminds one of strong remedial measures, intended to remedy lax morals, but which from being too violent, crush the subject.

To the same order, belongs the bitter cassava, (*Fatropa manihot*) which yields the tapioca and cassaripe of commerce. Its tubers contain a most wholesome and nutritious combination, of lignine, gluten and starch ; but which is protected by a poisonous juice, that renders the root in a fresh state deadly poison to man and beast. It is therefore apparently reserved for man, as food that requires the exercise of a higher intelligence than that of brutes to make it wholesome.

In the fiery tropics there are more instances of food and poison combined, than amongst ourselves ; and of what is healthy and right in morals being united with the pestilential and corrupt. The luxuriant vegetation, a benefit showered with a prodigal hand on the animal creation is accompanied by large animals of prey whose savage ferocity fills the forests with terror. The human inhabitants of many tropical countries have qualities which harmonize with such a fauna and flora :—*liberality* and bounteous *display*, are united with cruelty and profligacy.

One cause of these evils and crimes, consists in the mode of life pursued in the tropics, not affording scope for the full exercise of the mental powers in procuring the necessities of life. Thus in South America the Cow tree, (*Galactodendron utile*) supplies no indifferent substitute for milk, without the labour attendant on the management of cattle. The cream fruit (*Roupellia grata*) and the butter nut of Sierra Leone, supply the place of those luxuries, of the animal kingdom.

Caoutchouc or elastic gum, is the produce of a variety of trees, belonging to the same natural order, as the spurges and the nettles. This gum is applied to such a vast variety of uses, that it may truly be termed protean. It is capable of being twisted and turned, stretched and squeezed, and yet always returns to its original shape. It is a type of spiritual influences which are various in their movements, and can apply themselves to so many agencies. The gum elastic is a compound of carbon and hydrogen ; the principal elements consumed by the oxygen of the air, in the important offices of organic life. Caoutchouc was not applicable to so many purposes, until a solvent was found, by which it could be applied, as a means of rendering clothing waterproof. Most articles of

clothing absorb in a great degree the water in which they are plunged; but this Indian rubber and its preparations, repel water as effectually as metal or glass, and yet possess extraordinary flexibility.

Had it been known in the middle ages, it would have been appropriated to Satan. The natives of Brazil and Malacca who procure it; by their low morals and mode of life, show that they are much under the influence of Evil spirits. Modern chymistry has called in the aid of sulphur, as a means of increasing the utility of Indian rubber. Our ancestors would have ascribed this to infernal agency, of which it may possibly be a type. Especially as aiding in the insulation of the Telegraph wires, which more nearly approaches the means of communication, which we suppose to be practised in the spiritual world, than any process at present known to us.

A great variety of plants yield in fruit, root, stalk and flower, saccharine matter of divers varieties; which can likewise be obtained by the decomposition of starch. What is sweet is usually considered pleasant. It is certainly a type of what is agreeable; but what is agreeable is not always wholesome. Thus white arsenic and sugar of lead, have a sweet taste, although so noxious generally to organic life.

The cultivation of sugar began in China, from whence it was dispersed over the more western parts of Asia, and reached Europe through Phœnician navigation. The middle ages fell like a dark veil over religion, science and commerce; and sugar was meanwhile lost to the West. Europe returning the invasions of the barbarous hordes of Asia, brought to her own shores the science, the luxuries and civilization of the East. The songs sung by the crusaders, might truly have been dulcet strains if they brought back sugar to Europe.

The sugar cane was first planted in Hispaniola in 1506; and soon the great profit derived from its culture, made it the principal occupation of the European colonists. If the Spaniards conveyed it to Mexico, the Portuguese did the same to Brazil; and the cane wandered as *the walking stick of civilization*, over the West Indian islands.

The preparation of sugar involved the expenditure of a great amount of labour, which in intertropical latitudes, Europeans felt unsuited to their constitutions. The aborigines melted away under the cruelties and new mode of life, forced upon them by their European masters. But the desire for sugar did not dissolve in the minds of luxurious Europeans, who were only stimulated, to offer in return for it their choicest industrial products.

Negroes in the Canaries and other islands of the African

coast, were found to answer so well as labourers, that in due time they were removed to the western world. Their docility, strength and good natured fecundity, rendered them the true rough labourers of the tropics. Avarice uninfluenced by feelings of humanity, caused their removal in a forcible and cruel manner, and their retention in slavery, at first little better, than was their frequent lot in their own country.

A nation was said to dwell securely, when it "dwelt under its own vine, and under its own fig tree." These are wholesome fruits. The Negroes of western Africa, dwell under poisonous euphorbias instead of Vines, and under baobabs instead of Fig trees. It has been frequently said that the Negroes brought to the West Indies, were snatched from peace and plenty, independence and the dignity of free men, to be ground under the iron heel of masters, in whom sentiment would fain see a greater savage than in any African chief. But if we look at matters in their true light, we must see that the condition of the Negroes at the worst periods of servitude in European colonies, was an improvement on native life in Guinea, under unrestrained cannibalism, fetichism, and wholesale slaughter.

The Negroes besides having been isolated for many ages from superior races, are inferior as a raw material. Had this *material* been better and the *manufacturers* of a higher moral caste, more might have been done. But "no amount of washing can make a black man white." Europeans wanted sugar, and like "truly practical men," did not inquire how it was obtained; although a few afflicted with "Mawwormism," that dyspepsia of the mind, turned sour at sugar because it was dark, and so it had to be refined for their use.

The refinement of sugar illustrates the abolition of the transport of "blacks" from Africa as regards the British colonies. A step having been thus made towards the civilization of sugar, a further improvement was suggested—that of double refinement. The early slavery in the West Indies was a type of the old sugar process; and the modifications of slavery of the "*blood refining*." While its abolition, illustrates the *double* or charcoal refining.

These changes in West India society and sugar manufacture diminished both "blacks" and molasses. That molasses which was formerly allowed to become rum—that rum that gave our sailors courage, and that sent legislators to St. Stephen's with the exciting spirits of punch. But now this molasses, is most largely turned into pure white sugar,—a process by which much saccharine matter is saved.

The bamboos (N. O. BAMBUSACEÆ) are colossal grasses. The *Bambusa tulda* of Bengal, attains the height of 70 feet from the

ground, in the short space of a month; which is an average growth, of one inch an hour (Hartwig). Few trees exceed them in gracefulness and utility, for they perform offices in inter-tropical regions, which surpass all other grasses in importance except the maize or the sugar cane.

The Chinese split the long stems into narrow strips, which they twist into cables as moorings for their junks; the same material furnishes their sails and rigging. In some of the southern provinces of China almost every house is built of bamboo, and almost every article of furniture, claims this strong material as its parent. The young shoots yield the fibre of which the best Chinese writing paper is made. The seeds are eaten with choice honey, or fermented into beer, within the vast Indian empire. All the bamboos have a coating rich in Silica; the prickly species actually strikes fire with steel. The bamboos have jointed stems and a light feathery foliage.

Few vegetables are so strong in proportion to their lightness, and NO plant in the world, has so firm and so hard a stalk of such rapid growth. It is an exception to what is usually observed in plants and animals, for the rapid in growth are commonly soft in fibre.

This is a type of genius, growing with immense rapidity and towering over the heads of its companions. Genius produces a permanent impression on society; but its personal career may be *short*; or it may be *long*. It may blaze like a jungle of bamboos on fire for a short time, which leaves behind little but the smell of smoke and wreaths of white ashes. Or like the bamboo surviving for generations in a useful sphere, it may give the lie to what is said, of the early decay of rapid growth.

The Upas poison tree of Java (*Upas antiar*, N. O. ARTOCARPACEÆ) is far famed, but its deadly effects have been much exaggerated. According to the old accounts "no man, beast or bird, could pass near it and live." But this, if true was doubtless owing to the escape of carbonic acid, from fissures in the earth in its neighbourhood. This poison resembles the the superstitions of the Javanese, which act like a spell on their minds; binding them down to destruction and death. Yet antidotes exist; and this poison may be voided, ere its effects become irremediable.

Nux vomica has a powerful effect on the spinal marrow and occasions violent vomiting. In a very large dose death follows, and when taken in alcohol it is absorbed so fast into the system, that death is sometimes occasioned in a few minutes. The spine and brain, are the poles and focus of nerve action, which this first stimulates and then paralyzes. This substance has an

intensely bitter taste, due to the presence of the alkaloid strychnine. This bitterness is one great safeguard against its being taken by mistake.

It is a type of the action of literary works of a "sensational" character, which act on some minds in a similar manner to this poison; exciting the feelings to a violent extent, to be followed by a deadness and collapse of sensibility. Some persons take a pleasure in "gall and bitterness;" and in dwelling on the most painful, revolting and sickening subjects.

The mahogany tree (*Swietenia mahogani*, N.O. CEDRELACEÆ), is one of the most gigantic inhabitants of the forest, being often 100 feet high. It would need to be a large tree, to supply the numerous wants of civilized society. It is beautifully variegated, the finer varieties being feathered and striped in a remarkable manner. Its durability is great, and its dark red wood is among the most suitable for furniture.

The aboriginal nations of America somewhat resemble mahogany in hue. The Negroes resemble ebony. Ebony is a harder wood than mahogany. The "ebony" got the better of the "mahogany," and so the poor mahogany is cut down.

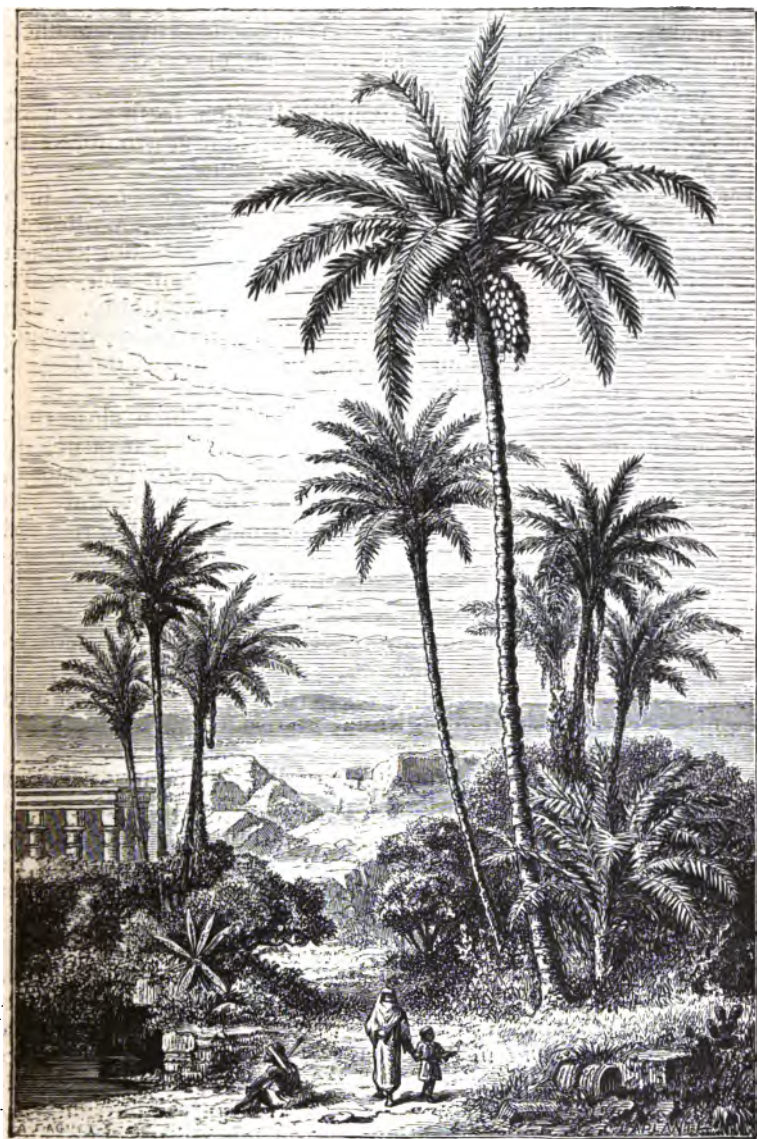
Some woods receive dyes, and are impressible in this way. A type of those individuals, who take their colorization of thought from others; harmonizing with them, if not assuming quite their complexion. Natural hues amongst woods may illustrate tints amongst races. The white deals and satins; the Scandinavian and light Indian races. The mahogany; the red Indian; the rose and Coromandel wood the dark Hindoos and Malays, and the ebony the Negro.

The Palms are characteristic of the tropics, of which they form, one of the brightest and most beautiful ornaments. Their graceful stems wave, and their leaves form a beautiful brush or tuft at the top, in some cases resembling a mop, in others a chimney-sweep's broom; while a third is like a feather dusting brush. They bear their fruit in clusters, the flower being enclosed in a spathe. They are no less valuable than beautiful; the juice of some, yielding when fermented, wine or other intoxicating liquor: others sugar in large quantities. The nuts of many species, yield fat allied to that of animals, which is of great importance in commerce; and is supposed by merchants, who wish to grow rich by philanthropy, to be the probable means of the Future Civilization of Africa.

The cocoa-nut palm (*Cocos nucifera*) grows nearly everywhere on the sea coast in tropical regions; and may be said to afford food, lodging and clothing. The Arabs consider the date a type of Providence, who presides over their destiny. The cocoa-nut is a type of Providence, extending over a far wider

circle, being produced alike in the East and West Indies, Polynesia and the Moluccas.

An entire ship may be built, laden, rigged and provisioned



THE DATE PALM, PHOENIX DACTYLIFERA.

with the produce of the cocoa-nut tree. Houses may be built of its trunk, and thatched with its leaves. Matting can be made of its husk, and beds can be stuffed with it. The rope which supports the hammock of him who sleeps, can be made from it; or the rope that suspends the wretched suicide, who in a moment finds the sleep of death, steal on him like an assassin's gripe.

The Cocoa nut furnishes a favourite oil, when fresh excellent for cooking in the kitchen. But when stale it is promoted to the parlour, as an ingredient in composite candles.

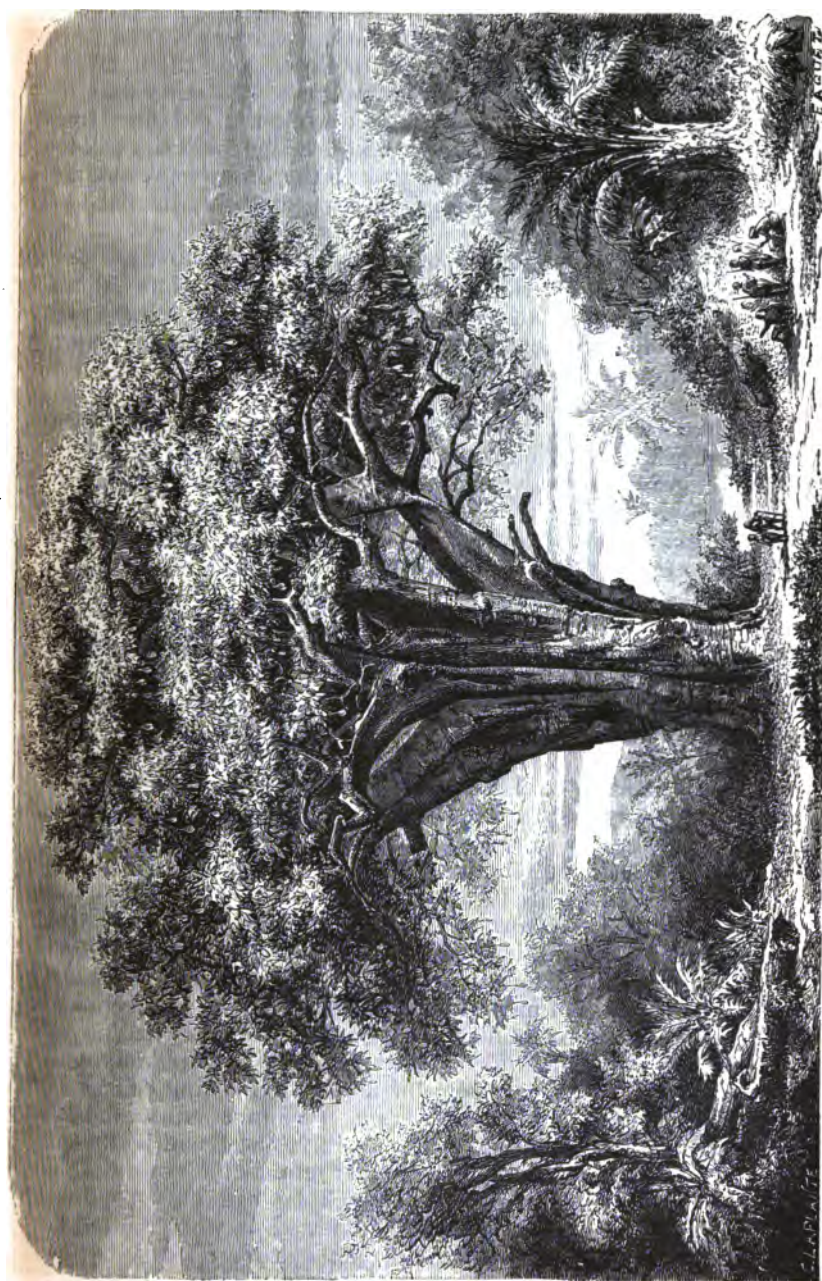
The trees may be tapped, or the unopened flowers made into toddy. When fresh this is a pleasant drink, but when allowed to stand it ferments, and becomes an intoxicating liquor; which may be distilled into the pernicious arrack, an evil spirit surely; the result of the cruel treatment of poor toddy. The best gifts of Providence when turned the wrong way, become the greatest curses. The finest geniuses when deranged, become the greatest wrecks.

The cocoa nuts are protected by a tough skin, a close network of fibre, and a thick hard shell, exceeding that of nearly every other nut in hardness and thickness. So precious a kernel, with the milk which feeds it in its infant state, is deserving of this extra care from mother nature. It is treated altogether as a baby. There is the smooth little overall; the fibrous jacket; and lastly the stiff bandage which keeps the tender little substance together. It is rocked securely in its high cradle, by its kind friend the wind. And soothed to slumbers by the distant lullabies of the waves. When it is ripe, it falls from its cradle; casts off its outer garments, and founds a genealogical tree for itself.

Trees and plants are the emblems of life; a country without them appears dead and utterly without hope. But they vary much in their degree of liveliness and cheerfulness, some wearing a funereal aspect as if weeping over the dead, but still living in green life, nourished as it were by their ashes, and pointing as the sap rises with the return of spring, to resurrection.

All plants remind us of *life, death, and resurrection*. But some do it in a melancholy, and others in a cheerful manner. The trees that shed their leaves, remind us of man who loses his life and regains it. While the evergreens, remind us of moral beings *without* mortal bodies—who do not *die*, and who do not teach us the same cheering lessons of PROGRESS.

Great trees illustrate nations, ages, and empires; particularly with reference to their continuance or longevity. The elm, horse-chestnut and poplar, are quite trees of modern times, and



THE BAOBAB, ADANSONIA GIGANTEA, FROM A PHOTOGRAPH.

represent by their ages, the period between this (1870) and the Reformation. The ivy carries us back a century earlier,—to “the wars of the Roses;” the larch to Bruce, and the humiliation of Edward the Second. The orange to the early date of the establishment of the Inquisition; while the old lime tree carries us back to the days of our Saxon Kings; and the oak to the period of the Romans. The yew to the time of the migrations of the Saxons and Scandinavians, and the Baobab to “the Flood.”

These trees by the length of their lives, thus illustrate our great chronological periods. They decay and fall like Ages; some being the type of Ages and Nations; while others are coeval with the residence of Man on Earth. That is to say with the descendants of Noah.

We have we trust in our *typical* review of botany; drawn attention to the many illustrations of man and his characteristics deducible from plants. The science of the *culture of plants*, affords many emblems, of the physical and intellectual education of man. So also does the education or subjecting of animals to moral restraint, illustrate that of man's intellect and propensities, to his higher moral faculties.

Agriculture is the science of cultivating the earth, for the benefit of mankind. It has been divided into two departments, that of fields and of gardens. But the same principles of cultivation apply to both. The soil must be prepared, plants or seeds put therein, manure and medicine applied, and the same celestial blessings invoked. The difference between the two systems of planting, consists chiefly in agriculture being on a rougher and larger scale, for the production and growth of the Staple vegetables of life, or those most in demand in society. While horticulture raises those luxuries, delicacies and ornaments, which render life pleasant.

We consider the culture of the ground, illustrative of human education; agriculture being the type of physical education, on which the life and sustenance of the body depends. This claims a place before that of mental, which horticulture so well typifies; for nations cannot be intellectually great, unless they are physically strong. Bread is as necessary to the maintenance and support of the frame, as fruits of a more refreshing character, are grateful to the stomach and brain. We must cultivate both branches, if we would enjoy either much. The bread feeds and the fruit flavours; the neglect of either renders life unprofitable.

Adam was placed in a garden which he had only to dress and keep; he was not required to plant. But when he fell he required to plant—significant of the culture needed by his

descendants, if they are to produce fruit, and even live on earth. Soon Adam's position was changed ; he required transplanting himself as well as his plants, and a new process of seed sowing in him, was as necessary as to the new Soil which he was sent to till.

Let us take up agriculture, and consider how far it illustrates physical education. In every description of planting, good *seed*, good *soil*, and good husbandry are necessary. In physical education, good stocks are required to found a healthy family ; a good situation in life, and parents with good constitutions, who live in accordance with physiological laws. Lastly that development and culture of the functions of the physical frame, which can only proceed from SELF-EXERTION.

There has always been a vast difference in the natural qualities of soils ; let us consider them for a moment, as illustrative of the position in which individuals are found.

The growth of plants as the growth of animals consists in the absorption by the germs of life, of certain disintegrating particles. This is a chymical operation, and is included in vital chymistry.

The culture of Animals is a higher branch of employment, than agriculture or even horticulture,—it is the type of Moral culture. And we see in the obedience of animals to Man, that they, consciously or not, are under the control of a being, subject to laws and regulations of a moral character. Man is the head and ruler in this earth ; and in proportion as he acts up to his true position, so does he rise as an individual being.

CHAPTER V.

LOWER ANIMAL LIFE, TYPIFYING MAN.

DIATOMS—DESMIDACEÆ—GLOBE ANIMALCULES—POLYPS—MEDUSÆ—VENOMOUS CREATURES—ECHINODERMATA—ENTOZOA—ROTATORIA—ANNULATA—ARACHNIDA—ENTOMOSTRACA—CRUSTACEA—MOLLUSCA—INSECTS—BEETLES—BUGS—FLIES—BEES—WASPS—ICHNEUMON FLIES—RUBY FLY ANTS—SAW FLIES—MOTHS—BUTTERFLIES—NEUROPTERA—ORTHOPTERA—HOMOPTERA—PARASITES.

LARGE things are *not great*, they are small, and small things are *great*. It is *not* the whale and the elephant that build mountains; that cover the sea shore with their skeletons; that animate the dust of earth; that inhabit the Arctic regions where no other form of organic life exists. Thousands of feet, down in the depths of the ocean, in all latitudes they live; yet so minute are their proportions, that thousands can exist in a drop of water, to which such a small space is a *world*. How vast are the possessions of these innumerable worlds, over which these creatures reign; but their lives are short. The panorama of life, presents them in the form of globes, eels, worms, snakes, stars, flasks, drinking cups, funnels, fans and fruits. They start into life, and enter at once on an existence of incessant motion. Some find their birth in the entrails of mountains, which to our view could never have seen the light of day. They perform all their functions there, and pass away, leaving their skeletons behind perhaps to form the foundations of pyramids.

Millions of skeletons, exist in a single cubic inch of stone, and perhaps are ground to polish the precious lenses of the optician; or to give to his steel or brass work, the lustre of light,—the power of reflecting lustrous light. They are like the *pioneers of progress* who often feel not its *blessings*, yet play their parts and pass away, that higher beings may shine forth from amidst their dust.

These creatures principally move by means of *cilia* (minute hairs) which likewise clothe the delicate internal and external organs of the higher animals. But although they play an analogous part in their economy, yet they are more emphatic-

ally the organs of lower animals. And thus in type, we see that although the lowest organs are indispensable to man, yet he should give the highest place, to his highest organs ; and he will suffer much if he neglects this.

Poison or galvanism, applied to these minute creatures, while it *kills*, yet does not immediately stop the motion of their cilia, which continue to vibrate for some hours after dissolution. In harmony with a class of organs, which are low in function, even when carried to the highest animals.

The term of life of these minute creatures, varies from a few hours to as many weeks. But until they have played their parts this term of life can be suspended for an indefinite period (according to Leuwenhock and Professor Owen). Embalmed in a grain of dust they for years lie as if dead, even where light, air, and the temperature suited to organic life exist. But give them moisture, and they start into active life, fulfil their course and die. Man's present life is short, long he sleeps in his tomb, perhaps a hundred, or a thousand times the length of his Life. But when the "spirit of life" touches him, he will rise.

These creatures can be alternately restored to a life of activity, and returned to their *dry death* ; or the period of their suspended animation. A type of those, who living by themselves, are seldom invigorated with that refreshing influence so needful to a true enjoyment of life.

Infusoria are typical of all classes in the Animal Kingdom, and their analogues the Desmidaceæ amongst vegetables, are equally the representatives of the highest classes to which they belong. How is this to be reconciled with the distinct and progressive Creations, that have brought the different links of a vast chain of organisms into being ? Only by this great Fact being acknowledged. That Man the highest organism, is the type of the lowest. And surely he was once a monad, or almost a monad ; as was first rendered clear by Leuwenhock. (Phil. Trans., 1678.) This is the first source of being of every animal above the Medusæ. The transformations man undergoes from his conception until his birth aptly illustrate the Great Divisions of the Animal Kingdom. This is the true view of Progressive Creation, for which Lamarck substitutes Progressive Development. His ingenious theory if not correct in fact, is so in type.

The globe animalcules (*Volvox globator*, Linn.) in form, remind us of the fecund germ. Little balls are encrusted with smaller globes, which in turn become greater. These minute creatures, are therefore founders of colonies ; and as they *develop*, the parent bursts. The great principle that a renewal or increase

of life, is accompanied by, if not the cause of death, thus pervades the lowest class. Death follows as a necessary sequence on increase, and is a requisite for maintaining the balance in a mutually supporting population. These fecund germs, contain within themselves, the seeds of dissolution, which their after development, renders more clear to us. They shine forth as they burst, the Founders of Life, the seeds of progress, the food of fish, the food of man, and the scavengers of the waters. They are the representatives of healthy increase—the type of the happy and well arranged social scheme, which in itself contributes to purify the “MORAL WORLD.”

The phosphorescence (*Peridinium tripos*, Ehrenb.) which illumines the waves, causes them as they roll like glassy cylinders to glow with a pale pure liquid light. This is the great light of the ocean coming from itself, and is a type of those, who are the means of opening up new knowledge or understanding of “the mighty deep,” proceeding from its bosom. They are like the intelligent mariner, who gets his light from the sea itself. But to this very light the sun of heaven contributes, by developing these minute organisms where they lie.

The Bastard Polyps (*Vorticellina* &c.) present an analogy with the molluscs, and are often of a bell shape; they are furnished with Cilia which some of the lowest animals have not. They are like those higher animals who use their arms in driving food into the body for their support as Cilia by constant motion direct the current of water into the mouth in which minute particles are floating. Even as the man, who endeavours to turn the “current of public opinion” towards himself by the motion of his moustache, or the Cilia of his eyes.

The Stentors are naked Hydras, capable of altering their shape, from an egg to that of a serpent; and when at rest assume that of a trumpet. All classes of creatures have their many sided representatives. Some without transformations, show extraordinary flexibility and adaptability; such as snakes amongst reptiles, and their representatives—the diplomatists. First appear the egg and incubus, secondly the serpent which makes its own way, and does the work of the three conditions; lastly the trumpet form, typical of exaltation and success.

The Polyps must be of the highest significance as a type. Their jelly or living portion, like the fleshy parts of man decays, and the bones or skeleton remains. Their skeletons go down throughout all time: in the seas of the present age; in the strata of the past; a type of the bony skeleton of man. On the bones of men great empires are founded. On the skeletons of what was once a clothed Polyp, a living coral, an Islet rises from the ocean's breast. And soon the noddy, the booby,

and the luxuriant palm, flutter and wave on the new domain, founded on the ruin and death of millions. These all, having played their parts, expire and leave room for higher forms of life.

Some nations possess a Hydra like tenacity of life, they may be cut in every possible manner, and yet each section forms the nucleus of a new nation; small perhaps, but still performing all the functions of a distinct and separate nationality. Such were the Jews; cut and divided in every possible manner, yet each fragment was representative of the nation, and became such in all lands. Thus the nation is unextirpable, having all the vitality, flexibility and grasping power of the Hydrias, in which they exceed all other animals, as the Jew perhaps does all other nationalities.

The Tubular Polyyps (*Tubularia*, L.) are a curious class, showing analogy to the *Amphitrita* among *Annulata*. They are of a tree like form, the animals living at the top of the tube, and casting out their tentacles like the feathery leaves at the summit of a palm tree. They appear to possess a circulating system, analogous to that of such plants as the *Chara*. This circulation, does not altogether depend on *cilia*, as in some of the lower animals. They have also some resemblance to *Serpula* amongst *Mollusca*: thus constituting an important link amongst classes. (See Johnston's *Brit. Zoophytes*.) The Tubular Polyyps, which possess a circulation higher than is general among their class, may be compared with the man, who circulates more than he can rightly call his own; who distributes the property of others, as if it belonged to himself.

The "dead men's toes" (*Alcyonium*, Pallas) have a sufficiently significant name, for in these animals of the Polyp class, death is typified by life.

Sponges (*Halcyonina*, Høeften) are highly important in commerce, their very softness and flexibility give them a preference over their more stony kindred the corals; yet the stony ones though brittle are alone suitable as foundations. The sponge is a type of what is soft, absorbent and impressible; of the kind of mind and brain, that can apparently take in a great deal, but cannot retain: soon becoming dry, and liable by pressure, to be turned into any shape or form. These men have their use. They are commonly inclined to spread over a considerable surface, yet have little solidity unless like the frozen sponge they are under powerful influences; they then attain a gravity not their own. But only lay hold of them with a warm hand, and they soften helplessly in your grasp, absorbing your intemperate heat at the same time. The sponge absorbs much

liquid, hence it is used to take up what cannot be got at in any other way. Thus the expression "sponging house," is used to imply the house of temporary detention in which bailiffs deposit debtors, who by yielding to the demand made upon them may escape from the present pressure.

Various articles in common use amongst men are well illustrated in this order. Thus we have the sea fan (*Gorgona flabellum*), which resembles a cabbage blade; the sea pen (*Pennatula phoroporea*); and the umbrella polyp (*Umbellularia*, Lam.) as well as the organ coral (*Tubifera musica*, Lam.), the tubes of which are like the pipes of the organ.

In the *Madrepora*, *Seriatopora* and *Millepora*, we see the analogues in stone of the soft sponges, once inhabited by living polyps. The sea mushrooms, or mushroom corals (*Fungina*, Lam.) show a wonderfully close resemblance to the mushrooms of our heaths and woods. Like them when old they can stand alone; but while young, love the parent stem, showing thus a forcible likeness to our own species.

Sea anemones (*Actinia*) like the Hydra, can turn inside out and receive no injury; and can reproduce perfect individuals from sections. They are viviparous, hatching their young from eggs within the body, and bringing them forth by the mouth. Their lovely colours, shape and markings, remind us of exotic composite flowers. They are ravenous as feeders, consuming what the Hydra would reject; but as they hatch their eggs themselves, they are much in advance of that class. Their name "*Actinia*," implies a high degree of sensitiveness to the sun's rays.

If the Hydra be a type of the Jewish nationality, these are a type of the Teutons, being more marine in their habits, more prettily coloured in complexion, less scrupulous in diet, and inclined to hatch their own offspring or colonies. The tentacles of the *Actinia*, have analogy at once to the vegetable world, and to the mixed independent and dependent character of Teutonic society, in which all hang on *one stem*, yet mostly work on their own account.

The sea nettles (*Acalephæ*) and *Medusæ* a jelly like division of the animal kingdom, are higher in organization than those classes which preceded them; some even displaying the rudiments of a nervous system. They move however, only by the expansion and contraction of their blubber like bodies. When incautiously handled many species excite a stinging sensation, similar to that which our common nettle produces; and from an analogous cause. For the minute hairs with which the surface of the skin of this animal is covered, show a resemblance to the poisonous hairs of the nettle plant.

In some of these *Medusæ* we see analogy to men of a low class ; who like these creatures are not quite the lowest of their kind, for they have sufficient intelligence to do great mischief. The lowest of all are too lethargic to irritate or injure actively. These venomous persons are like the *Medusæ*, dangerous to handle ; but with all their biting and stinging properties which excite our dread ; they can never command our respect, as they are wanting in that noble simplicity which may show sternness, but not venom.

Only low classes of creatures, or the lower members of a high class are venomous. The higher mammals are not *venomous* ; only such as the skunk, the weasel and the *Ornithorhynchus*. The sharks or higher fishes, and among the reptiles the higher lizards, are not venomous. Neither is the boa the grandest among serpents. And so amongst the *Amphibia*, the newts and toads which are poisonous to the lower animals at least, are beneath frogs in structure. The stinging insects among the *Hymenoptera* are beneath in structure the non-venomous *Coleoptera* ; although their sting is not used to procure prey, so much as in self-defence. And even among *Lepidoptera*, to the *Bombyces*, one of the lower divisions of the order, is given the principal place of scourges to agriculture ; and their larvæ are sometimes capable of irritating the skin of the highest of animals, to the extent of producing inflammation and death. Such does the *Bombyx processionis* of Linnæus, the caterpillar of which causes great irritation by means of its hairs.

In this class, which is much in advance of the first divisions of animal organisms, we see another illustration of the same principle, which is carried to a far greater extent in the higher animals—that the stages *before birth* or early existence, represent lower divisions of the animal kingdom. Thus the eggs of the *Medusæ*, quit the saccules of the mother, much resembling the *Ciliated Infusoria*, *Leucophrys* or *Bursaria*, (Van der Hoeven, Eng. Trans. vol. i. p. 100), from which they gradually advance to the perfect type of their class.

It is important to remark also as we advance in our review of the higher orders of nature ; that the lower classes possess most perfectly the power of reproducing lost organs or portions of organs and of supplying defects. This power is possessed in the least degree by man. In this we only see a continuation of that analogy, which marks him in our world as the great centre of nature, aptly included in the word "*Microcosm*." And as we rise from the savage to the philosopher or from the meanest peasant to the prince, we see the same chain of analogy. That the lowest individuals of Our species, supply their wants most easily ; and the highest have most difficulty in filling

up vacancies. The injury we experience from a fall, is generally in proportion to the height from which we fall.

With the sea bladders (*Physaliam*) though not standing first, we commence a great class, which is included in Radi-



PENTACRINUS CAPUT MEDUSÆ.

ata. These bladders are called "Portuguese men of war" on account of the colours they present — exquisite lilac and blue, reminding us of the bright colouring of foreign vessels. The crest these creatures exhibit, resembles faintly a vessel with a large lug sail spread. These sea bladders have little solidity, and are in fact mere bags of water. A large individual weighing when living 30 or 40 lbs. shrinks to a small bulk when dry, and only weighs a few ounces. These Portuguese men of war, are dangerous to handle, on account of the inflammation, excited by an acrid secretion with which they are furnished.

The term "Portuguese man of war," as applied to this creature, sounds like a nickname, such as might be given by our sailors in derision of the Naval forces of a nation, which displayed little courage in proportion to swelling pretensions. Yet these very sailors, when

in the *power* of a Portuguese man of war, might be made to suffer a punishment, which would be severe, when contrasted with the former contempt in which these enemies were held.

The Echinodermata or great class, including the sea urchins, sea lilies, star fishes, and the sea cucumbers, form with the In-

fusoria and Polyyps, the great division Radiata. The *stars* of the waters, take forms as various as were ever given to the constellations of the Heavens, by the most fertile imaginations of astronomers. The Echinodermata show a great rise on the lower divisions treated above ; but still have great power of reproducing lost parts, suitable to a low class. The "paradise of these low forms of life," appears to be the East Indian seas.

The principal and most beautiful divisions of this class are extinct, or nearly so ; for their Age is passing away. Although we still see the rare *Pentacrinus caput medusæ* ; the sea lily of the present West Indian seas,—the last species of an extensive division, of which ten or more examples crumble in museums.

"A single rose is shedding there,
Its lonely lustre meek and pale ;
It looks as planted by Despair,
So white, so faint, the slightest gale
Would whirl the leaves on high."

The star fish (*Asteriæ*), vary in size, number of arms and texture. They bend their arms and creep along the sand or stones, for their food consists of the small Mollusca they find at the bottom of the sea. They may be taken as fairly representative of the class Radiata. Many of the species secrete an acrid fluid, which vesicates the human skin, and acts as a poison when taken into the stomach.

Unlike the "sea eggs" which have such bulky bodies, these creatures have hardly any body, being mostly developed in the arms. When we consider their size, we must admit that they are weak, helpless and insignificant ; like most creatures of other classes, whose limbs are greatly disproportionate to the bulk of the body ; unless they possess some extra provision, in an eminently powerful muscular system.

The sea urchins (*Echinidæ*) are covered with stony spines over a hard shelly coating, and are provided with very formidable jaws, the teeth of which are tipped with enamel. Their shells consist of plates united to each other, of a five or six sided figure. They cannot swim, but creep along the bottom of the water. Their food according to Valentine is principally seaweed, but they also eat Mollusca.

These hedgehogs of the deep, are typical of those soft flabby individuals in human society, who would soon be destroyed were they not protected, by the usages of civilized life. The "sea eggs" must fulfil an important place in the economy of Nature, or means like this would not be taken for their protection. First the stony shell and then a covering of spines, that they may more frequently resist the attacks of their enemies. Orders of less importance, or which are more prolific, do not require these extraordinary aids.

Those creatures which are found in the greatest variety of situations, and are gifted with the greatest degree of fecundity as species, require less armour to protect them, for their ubiquity prevents their extinction; their enemies cannot attack them everywhere at once. Animals that are from their numbers or extensive distribution difficult to extirpate, usually perform specially important offices in Nature.

The sea eggs need a double covering of protecting armour, being sought after as food by man, and a vast variety of the greater fishes. An analogy carried to the higher animals. The oysters and cockles so much prized as food, have hard shells. The ant-bear, the pangolin, the armadillo, the turtle and tortoise, and the eggs of birds and of many reptiles, mask their rich flavoured contribution to the food of the world under a thick skin or shelly covering. In the vegetable kingdom also, we see a like protection afforded by the rind or shell of fruits and nuts, to the choice aliment within.

The sea cucumbers (*Holothuriae*) are named in accordance with the considerable resemblance they present in form to those delicacies amongst vegetables. They are wholesome and nourishing articles of diet, being dried and smoked by the Chinese and Malays under the name of *trepang* (*Holothuria edulis*) which they use for thickening their soup. They have very little appearance of animation or power of motion, being "as cool as cucumbers." Which proverbial expression is founded on the analogy between that cool vegetable, and those exceptional individuals, who scarcely ever get warm under any treatment, unless they are "*put in a stew*."

The worms (*Entozoa*) that exist in our bodies while we yet live, that crawl, climb, or suck their way from our brain to our feet through every part of our system; are types of that universal state of degradation into which man has fallen. These creatures devour us before we have become the legitimate food of worms. They are a type of *living death*. Those who are free from internal parasites, are typical of the *Regenerate*, who have cast out internal sin. The sin of "the regenerate," or external sin, is illustrated by those creatures that cling to man's skin as long as he lives.

Entozoa are not confined to man, but pervade the internal organs of Mollusca, fishes, reptiles, birds and mammals.

Intestinal worms (*Caryophyllæus*, Gmel.) are a heterogeneous class made up of divers forms which can hardly be otherwise arranged. They go through many transformations, adapting themselves to their different locations in animals, and show an indestructibility almost like that of the Hydra. They can exist under very different circumstances, living in the lungs of some;

the brains, stomachs, intestines, and especially the liver, of others. Such parasites are difficult to extirpate. In this we see an analogy to sin, which is taken up in a worse form by contact with those in whom the moral disease has made more progress than on ourselves. "Evil communications corrupt good manners." Although perhaps no person is utterly free from parasites, still there are some species more virulent and noxious than others; just as there are degrees of flagrancy in crime.

Fish are infested by tape worms, which in the stomachs of the water-fowl that live on fish, take a higher form.* What is a little sin in a small person, is a great sin in a great person, the enormity being a good deal in proportion to the status of the guilty party.

The Cystic worms do not possess a mouth, and are therefore obliged to receive their nutriment through their skin. When present in man's body, they may illustrate innate sin; not the sin that he acquires by contact with other sinners, but of that which absorbing his own substance, reduces him to a low level of degradation. When his brain is infested by worms, it is rendered incapable of its healthy functions, and causes the individual to be unsteady in his walk like a "sturdy" sheep.

Tape worms which some writers consider merely the early stage of the cystics, are flat like a band or girdle, and are found in the intestines of man and animals.

The wheel animalcules (*Rotatoria*) were formerly included in the Infusoria, and are manifestly higher but more complicated in organization, approaching according to Nitzsch, the structure of the Crustacea. They have been well termed "wheel animalcules," as they consist of a number of circles revolving within each other. The motion of the *cilia* of some species, causes an optical illusion, giving the revolving circle the appearance of a toothed wheel, like that of a watch. The proverb "a wheel within a wheel," is here forcibly illustrated; and thousands of these wheels may be contained in a drop of water, which is carrying the illustration still further. Their sexes are apart, and they multiply in a manner, analogous to that of the higher Insecta and Vertebrata. Showing that members of a low class, can approach a higher, which indicates the progressive elevation of low forms. How different is the degeneracy or fall from a high class as seen in the frogs, whose generation is little above that of the lower fishes, or the still lower animals without a backbone at all, being even below that of most insects.

The Amphitrite (*A. magnifica*) is justly named magnificent, and is the king of its class, resembling a sunflower or Chinese umbrella on a flexible stalk or peduncle, showing the same

* *Ligula simplicissima* in fishes, becoming *L. sparsa* in birds. See Von Siebold.

resemblance expanded or contracted. It is not attached to the tube in which it lives, but can withdraw from it. It is a native of the seas in the neighbourhood of Jamaica.

It is generally in the tropics, and on the shores of lands rich in spices and luxuriant exotic Fauna, that we see "the paradise of low forms of life." The Amphitrite typifies by its extraordinary envelope a special nursery for the cultivation of what is gorgeous and magnificent, yet morally low. Here man has done little to elevate himself or develop the resources of these regions in proportion to their extent. The Amphitrites on account of their protecting tube, are less injured by the molluscs and the fishes of their native seas, than their more naked allies.

The Serpula have been degraded from their position amongst Mollusca. These remarkable animals, encrust the shells of other creatures with the calcareous tubes in which they live. British species are small, but those of Peru, Chili and Patagonia are of a monstrous size : another link in the harmony between low human and animal forms inhabiting special regions of the earth.

The Annulose animals that possess antennæ, burrow in the sea-shore ; and are sought as a bait for the fishermen. The *Arenicola piscatorium* is very common on our sandy shores ; it has 13 pairs of gills. We turn our worms to good account, in using them to catch higher animals for our food ; but they are smaller than those of other countries, and in a low and more insignificant place. These worms are typical of degraded classes amongst human beings. In tropical countries a great degradation of morals, prevails in high places, which contrasts unfavourably with the state of things in our country. This, the bait of the fisherman illustrates. Our degraded human fellow subjects, are not generally allowed to occupy important positions.

The sea mouse (*Halithæa aculeata*), is decorated with the hues of the Rainbow, and is our most beautiful member of this class, being common in the seas of Britain. A type of the most elevated members of low classes among ourselves. "*Man is but a worm*," and yet can rise in proportion as he reflects the light of heaven, to a brilliant position in the status given to him.

The creatures which breathe by means of *slits* as do the centipedes, spring tails and many parasites, have been placed by Lamarck in a class called *Arachnida*. They are not much in repute except as loathsome objects ; some being merely detested and avoided, while others are dreaded. Their habits however, render them among the most curious members of the animal kingdom. Their organization is simple, but very efficient.



TRANSFORMATIONS OF THE DRAGON FLY, *LIBELLULA DEPRESSA*.

A, Perfect insect. B, Perfect insect emerging from the pupa. C, D, Larvæ and pupæ. (See page 149.)

The cheese mite (*Acarus domesticus*), meal mite (*A. farinæ*), and the sugar mite (*A. sacchari*) do much injury to our stores. The necessities of life living or dead, have their peculiar enemies which lessen their value, and are types of that "food for the mind," which is infected by a *loathsome* taint. Some depraved appetites prefer such food, like the eaters of *mity* cheese.

The pseudo-scorpions, are allies of the venomous scorpions, but are without tails; and though eager to attack, have not the power to injure large animals, that the true scorpions have. They may be compared with that man, whose "*bark* is worse than his bite."*

The Arachnida are small in our country, but in the tropics they reach an enormous size, equal to that of the largest insects, and the smallest birds, fishes and reptiles. They have little to recommend them in character. They are treacherous, malignant and spiteful; and when desperate, the scorpion has been said to commit suicide.

The scorpion is an enemy to great and small creatures. It resembles those satirists who live to torture others, but contrive to torture themselves most; and at last may fall into that wretched state described by Lord Byron.

"The mind that broods o'er guilty woes,
Is like the scorpion girt by fire,
In circle, narrowing as it glows,
And maddening in its ire;
One sad and sole relief she knows,
The sting she nourished for her foes,
Which never—never yet was vain,
Gives but one pang and cures all pain,
And darts into her desperate brain."

Spiders are by far the most numerous of Arachnida. By the clever traps they lay for insects, and by their cunning ways, they show analogy to some of the criminal classes in large cities, who live on those they catch; and who from their dark spider-like dens, watch the helpless entanglement of the weak, until they are completely in their power. They have so little sympathy for each other, that the stronger sell the weaker's blood, when no other prey is within their reach.

Some spiders (*Mygale cæmentaria*, Latr.) construct a nest of earth with an ingenious valve, like the lid of a snuff-box. A suitable castle for the "Giant Despair" of the smaller insects; into which it can carry its prey when ready to be devoured. Spiders even at the breeding season, have no affection for each other. When they approach to propagate, the stronger female often devours the weaker male, who tries to get out of her way

* Sir W. Scott's *Monkbarns*.

as soon as possible ;—an instance of ferocity only paralleled amongst wolves, or the fabled Amazons. Other spiders form no webs, but jump on their prey like tigers.

The bite of the tarantula (*Lycosa tarantula*) is said to be followed by a dancing madness curable by music. When persons were possessed by a spirit of prophecy, they were seized with frenzy or ecstasy, which was soothed by music—like the bite of this spider.

The Crustacea are a class of animals, having a hard shell but no skeleton, and are higher in rank than insects as they breathe through gills ; yet they are lower in other respects, as their power of restoring lost limbs is much greater. The head of the Crustacea is the limulus (*Polyphemus gigas*, Lam.) which possesses a spear-like tail with which it attacks those who handle it. So monstrous a giant, could only find an appropriate home on the coast of the Moluccas or the Oriental Archipelago where so many atrocities are committed.

The *Cyclops vulgaris* belongs to the important division Entomostraca, and has been much studied by the naturalist on account of its wonderful structure and habits. It varies in colour with the soil beneath the water in which it lives, and possesses a single eye, which has caused it to be named after the classic giant. Very few animals have a single eye. To the ordinary observer two eyes are necessary ; for they alone enable him to see an object in its right proportions and in its right place ; they should both look towards the same point and become as one. Spiders have eight eyes ; and are thus emblems of spiritual agencies who have extraordinary means of vision. This little Cyclops has but one, and that on the top of its head, and is a type of those who can only look upwards when they are in their right position.

The woodlice (*Oniscides*) are useful in eating up decayed vegetable matter ; but by their action they contribute to this decay. Their value to society is similar to that of many professions and trades, that certainly do rid us of much refuse ; but they make at the same time, a great mess themselves.

The soldier or hermit crab (*Pagurgus*, Dald.) has an intense love of the home it has taken possession of ; fighting desperately in its defence. It is helpless when away from home, but can stand a formidable siege when it has its shell on its back.

The robber crab is a furious destroyer of the fruits of the cocoa-nut, and other palm trees. These crabs in a wonderful manner, tear away the thick covering of the cocoa-nut with their immensely powerful claws, until they reach one of the eye-holes. This they force in ; and with a long and narrow

claw, extract the white kernel. They breathe through gills which they require to moisten with water. They remain on land during the day; but at night visit the sea. They construct deep burrows among the roots of trees, forming for themselves a comfortable bed of cocoa-nut husk. They are of an immense size and formidable in attack, but are excellent eating. The abdominal section yields fat, which when melted is sufficient to fill a quart bottle.

This creature was observed by Mr. Darwin in the Keeling Islands. These Islands have only the pig amongst European domestic quadrupeds—the lowest and most grovelling of them all. These pigs may illustrate the English settlers, and the monster crabs, the Malays who inhabit the Islands. Crabs are not usually emblematic of anything good. The crabs of the Moluccas are huge compared to ours, and illustrate monster vices, which are found generally to accompany, the greatest development of low forms of life.

The Mollusca as a class are suggestive of a certain stage in man's existence, the pulpy stage—when he is enclosed by a comparatively hard case.

The cuttle fish (*Sepia officinalis*) is one of the heads of the class, but has so little dignity that it changes colour like a naughty child when detected. And not content with this; endeavours to blacken whatever is near it.

The tender univalve mollusc, shrinks from the crustacean prowlers of the deep. In peace it expands its many-coloured arms and crawls from rock to rock. Its house is its fortress; once within it, the ferocious crabs storm at the door in vain. All the waves that tear the trees of ocean from their moorings, roll far above the unconcerned mollusc, which glides along its course and dies. Its fortress is its coffin, soon an empty one, vomited upon the beach—its only monument; but in the rocks of every country, every climate and every age an imperishable relic of its being.

Sensitive genius recoils from the scoffing crowd into the shell of self, and there feeds on what it has gathered from the outer world. Its influence is more permanent than that of the noisy mob without, for it leaves behind it an everlasting memento of its existence.

The terrestrial Mollusca, such as our common snails, are proverbially slow; but leave a track behind them, which the most brilliant insects often do not.

The oyster (*Ostrea edulis*) has no head. This is typical of man's dependence on a Higher Power. The oyster makes no effort, to move from the rock on which it is cast. It has a wide mouth, and is self-contained like the Dutchman, yielding

only when the knife is at its throat. It now and then produces a pearl; but never "a pearl of great price."

The pinna is fastened by a silken beard to the rock; and was said by the ancients to be attended by a little crab, which gave it a signal, to close its shell as danger approached. This resembles those monitors, whose presence is not pleasant but useful.

The Pholas and Teredos, suggest the greatest engineering feats; and what great deeds may be accomplished, by the judicious application of a feeble force.

In the shells of Mollusca, we see resemblances to every class of animals and plants. In their first state, when shed as spawn, they remind us of the ova of fishes or frogs. They are a type of the fleshy, pulpy individuals, who are slow in motion, and suited to low life.

The beauty and singularity of the shells of many of this class, have caused them to be objects of study to those, who are comparatively indifferent to Nature. Fancy or discrimination has given them names illustrating every class of objects, natural and artificial. From the mineral kingdom to high forms of life. From the razor, the trough and the wedge; to a wreath, an ear and a tooth. To the sailor, to Noah's Ark,—and to—Venus.

The class Conchifera or bivalve, is the lowest of the Mollusca; the class which contains almost the only true hermaphrodites. The univalve Mollusca, require in many cases the agency of two or more individuals, to perpetuate their species. But these conchiferous animals, are quite independent of each other's aid in propagation,—with some exceptions.

The higher we advance in the scale of creation, the more perfect is the separation of sex, until man is reached. Yet occasionally, we see in him an analogy to the hermaphrodites, the type of his greatest degradation. "In the beginning they were male and female." One of the greatest beauties of a high class of life, consists in the separation of sex. The sexual feeling being most perfect in the highest class of minds, is dependent on the innate constitution of these individual minds, which must exist as long as mind and consciousness. Why should we unsex ourselves, and become half a species? The mind of each is so constituted, as to cultivate extremes of qualities, that the species as a whole may greatly progress. This explains sex, and constitutes its permanent distinction; not the mere requisites for propagation.

The Terebratula is a genus nearly extinct; but it was formerly one of the leading divisions, of the shell-bearing animals of our seas. In shape they remind us of the beaks of birds, or of the cuttle fish somewhat distorted, and show the analogy that con-

nects them with a higher class. The more we study organisms, the more we are convinced that the lowest are connected with lower members of a higher class ; either by actual resemblance, or by analogy.

The antique lamp (*Anomia ephippium*, Linn.) shows a faint likeness in shape, to the *Lucerna* of the Ancients ; being but another proof of the repetition by man, of the forms of natural objects, which he modifies to suit his own convenience. One species of this genus (*Terebratula cranium*, Linn.) shows a resemblance to a skull cut open, while another (*Placuna*) is so transparent, that its valves are used for window glass, in China.

The thorny oyster (*Spondylus*) by its rude, rugged, heavy structure, and rich colouring, shows much resemblance, to the somewhat grotesque, but elaborately carved furniture, made of fine tropical woods. Such has been much in fashion. Chinese porcelain, was no doubt greatly suggested, by shells of this and other classes. The Pecten or "Venus' comb," suggests that necessary article of the toilet, as the Spondyli do the brush ; and the hammer oyster (*Malleus vulgaris*, Lam.) those implements of the carpenter, the hammer, and the T-shaped ruler.

The pearl oyster (*Avicula margaritiferus*) produces the famous pearls of the East ; which reach their maximum of beauty in the Persian Gulf. The lining of the shell of all pearly molluscs, deposited on a grain of sand or extraneous substance, becomes in time a brilliant calculus. The smallest atom may thus in a proper situation become the foundation of what is great and beautiful. The most painful diseases, (for the pearl is nothing more than a disease) assume the most brilliant and magnificent appearance.

The pearl's delicate hue, that silvery whiteness with a tinge of gold, fresh and clear, yet rich, is the complexion of a lovely girl (*Margarita*). But like her, it needs the lustre of other gems. The coral of the sea for the lips, and the delicate carmine seaweed, to cast its veined branches over her cheeks. With eyes of varying lustre, deep blue, reflecting hues of ocean, and a clearer, brighter blue ; when with contracting pupil, the bright light of Heaven streams on her face. She is a pearl of the waters. Persia's coasts may produce pearls, but not pearls like this. And for the honour of fair Scotland, England, Wales and Ireland, it must be said that they produce *these fairest pearls*. The deep beds of Highland lochs or slow-running rivers, yield the purest pearls, from *Unio margaritiferus*.

The mussels (*Mytilus edulis*) of our common rivers, to some persons are wholesome and nutritious food ; to others poisonous : and most powerfully exemplify, that what is good for one, is

not for all. Everything has its place, and *nothing* is originally poisonous in Nature, *unless corruptly used*. Every object is detergent upon some other object; and our great poisons are often our greatest antiseptics.

The mussel, is one of those shells that under a rough, crude epidermis, hides a beautiful hue of a rich, dark, indigo-blue, inclining to violet. The brightest hues of many are also under the surface. Man's blood is of a rich purple, or a bright red, in proportion as it is oxygenated; and the colour of his muscles and internal organs, is brighter than that of his skin. The skin of the most perfect men is nearly white, that it may include all colours; this very outside, contains the elements of the brighter tints below.

Arca Noæ, has been so named from the fancied shape of the vessel that formed the bridge that connects us with the Antediluvian world.

"Across whose trembling planks our fancies stride,
Into the realms of mystery and night."

The ship worm or *Teredo*, like the small insects on land, accomplishes more than the greatest monsters amongst its class. It is incessant in its labours, boring night and day, reducing the stoutest timber, exposed to its attacks, to a crumbling honeycomb. The little bivalve shells advance through the wood, never turn back, and there they die. The puniest efforts multiplied many fold, make up great results. The smallest profits, are consistent with the largest business, and generally accompany it.

The *Clio borealis*, is one of the principal articles of food of the northern whale (*Balæna mysticetus*). These creatures the size of a line in length, possess thousands of minute suckers, for catching their prey; showing that the smallest individuals, have the greatest facility in laying hold of, and catching what is small. An analogy which applies also to man, in the tenacity with which little men seize, and retain what they desire.

The glass nautilus (*Carinaria vitrea*) is curiously constructed, for the shell covers only a very small portion of the body, just where the heart and branchiæ are situated. The shell is in the form of a little cup, and has a singular appearance. It is a type of those savage tribes, who cover but little of their nakedness. Such are easily attacked by mosquitoes, as these molluscs, are by the minute crabs of the ocean.

The vast sea,—a type of the earth, is probably peopled by high intelligences. (See Rev. v. 13.) It is a mirror of human life. Lively, sparkling, seldom still; its waves perform labours as numerous as those of Hercules; they fill the water with gases from the air; they crest the tide of wealth and health

which ebbs and flows towards the shore ; for by their aid the fruits of opposite quarters of the world meet. An account of the living myriads of the sea would fill many a library ; they are analogous to those of the land in their mutual dependence, their lives and their propagation. The motions of the sea, like human passions do not always storm, but live until that glassy bay is reached where all is calm, and life itself stands still.

The Chitons are clothed with a shield of plates, analogous to that of the woodlouse or the tortoise ; while the limpets (*Patella*) resemble the knee-cap, or a cap for the head (*Pileopsis*). Some even like hats in modern use, have a little aperture for ventilation (*Fissurella* and *Emarginula*, Lam.).

The Chitons are typical of plate armour, used to protect the tender body, or of the ships built in links to yield with every motion of the waves ; and yet capable of being made rigid at pleasure. The power they have of coiling themselves into a ball, they possess in common with woodlice, and their analogues the lower Insectivorous and Edentate mammals. These last are types of unthrifty human beings, who may descend with the loss of their teeth, to a lower class in society, than that to which they properly belong.

There are pyramids (*Pyramidella*) among shells, as well as mitres (*Mitra*), tops (*Trochus*), turbans (*Turbo*), turrets (*Turritella*) and helmets (*Cassis*). The terrestrial molluscs, are mostly small in our climate and in northern Europe. They are a type of what is slow, flabby, indolent, and unintelligent in human life. In South America, Ceylon, and the Isles of Sunda, they attain a great development. In Africa where they are still more gigantic, they are largely used as food. They are usually more dull coloured, than the marine Mollusca ; but some display as brilliant tints as any ; except those metallic, or pearly hues, which sometimes decorate the marine shells of the tropics. The porcellaneous and highly polished surfaces, are also more common in sea, than in land shells.

The *Limnæa* or mud snail, in some instances requires the assistance of three or four individuals, for the multiplication of their species ; while others can perpetuate their kind unaided.

These are a type of those degraded races and individuals who are polyandrous in habits. They descend lower, than do the higher members of the molluscan class, which preserve distinctions of sex.

The CEPHALOPODA have distinct sexes, and have in some cases internal shells, allied to the backbones of a higher order. They thus stand at the head of molluscs, and include the king of shells, the pearly ; and the queen, the paper nautili (*Argonauta argo*). The shells of the pearly nautilus (*N. pompilius*)

are chambered : an immense advance in organization, over the inferior divisions of the class. They are so graceful in form, so elegant and pearly, when the rough epidermis is removed, that few objects in nature exceed them in beauty. Many shells likewise, are dull coloured and rough in their natural state but when polished are brilliant to the eye. These should be studied in both states ; while the whole beauty of others lies on the surface. The least touch of the polishing tool mars their fine lustre.

“ Which is when unadorned adorned the most.”

A mollusc may thus be ornamented with colours rich and glowing, which are invisible to man until after its death.

The reputation of a saint, a hero or philanthropist attains its greatest lustre when his life is passed, for like the substance of these shells, by reflecting the light of heaven in all its iridescence, it is a fit ornament for every age.

These Nautili, inhabit only the last chamber of their shells ; the others being reserved, to be filled with water by their syphon, when they desire to sink. This mechanical appliance is used by this low class, as well as by man, who like the nautilus lives in his last chamber—where the last events of his life occur. He cannot go back into the past ; he must go onward. In proportion to the length of his life ; it may be in great events or it may be in years, so is his attainment.

The cephalopodes are for the most part extinct. The Ammonites and the Belemnites, were amongst the most highly developed Mollusca ; the great age of which is past, but an age in which the higher animals predominate, has come.

It appears to be a leading principle in progressive creation that throughout all the great ages, Representatives of the great classes should exist. Yet the standard of life, rises with progressive ages ; but Genera which belong more especially to certain ages become extinct.

INSECTS.

One of the characteristics of the present day according to Mr. Phillimore, is the increasing interest devoted to *Entomology* or to the studying of things from an entomological point of view : making much of little things, or dwelling long on what is of trivial importance. That this may be done sometimes in the present age, as in every other, is a statement in which most persons would agree. But if we survey entomology, we find that it is a *great* and not a “little” science. Man may extirpate the elephant, perhaps the whale, certainly the moa, the great

aук, the larger reptiles and large land vertebrata generally. But Cæsar, Napoleon, or a nation powerful beyond all precedent, might shrink from a task, which would exhaust ineffectually their most strenuous efforts: they could not conquer the insect hosts.

The *bashikoui* ants of equatorial Africa, if we may believe Du Chaillu, drive before them the elephant, the lion, the gorilla and man. The great armies of God, are not lions, leopards, or the vulture tribe; although all these play their parts; but "the countless locust;" the greatest scourge to society in the animal world. This has its prototype in the hordes of Tartary, which in the middle ages "swept like a pestilential breath from their Steppes, to stifle the tenderest long cherished blossoms of art."

The beetles, so generally distributed, are scientifically called Coleoptera. They stand at the head of insects as the most perfect of their class, and many species shine brilliantly. The variety of hue and form in this order, far exceed those of any other division of insects or of the animal creation. The collector of beetles, like the collector of anecdotes, preserves many for their beauty of colouring, and others for their grotesque character. Beetles illustrate many trades. There is the wood-boring beetle,* the burying beetle which undertakes interments, the scavenger beetle, and the numerous mining beetles, for wherever man goes the beetle goes. Man's actions are thus specially illustrated in the world of beetles, which are the longest lived among insects.

The book worm (*Atropus*)—the larva of a beetle, is a type of those collectors of facts and patient students, who bore deep into the recesses of literature, to prepare the way for writers of a higher order. The book worm comes first, then the beetle. The book worm works harder than the beetle. Some persons say the beetle does not work at all. Does he not live in a light which would kill the book worm? and does he not provide for a future age? The larva of this beetle works greatly in the dark; but in its perfect state the insect does not dread the light. In like manner collectors of facts, or "bookworms," form windows often in the dark to admit light upon literature.

There is the ivory beetle that bores in ivory. Another species bores through lead. There is the bacon-eater (*Dermostes lardarius*) among beetles, the grave burrowing beetles, the beetle that infests our museums (*Anobium puniceum*), particularly the entomological cabinets.

The water beetles are our masters in the art of progression under water, for they possess marvellous powers of swimming and diving. They move with great rapidity in the water, and

* Such for example as "the death watch," *Anobium tessellatum*.

are the ducks of the insect world. Like our own aquatic population, they are not at home, except on, or in the water.

The bugs or hemipterous insects are inveterate suckers of the juices of animals or plants; they grow heavy as others grow light. In the United States almost every insect goes by the name of "bug"; those that are very noisy are termed "Humbugs."

"Come let me flap this *bug* with gilded wings,
This painted child of dirt, that stinks and stings"—POPE.

The flies or DIPTERA are not liked, but yet generally distributed. They make little provision for the future, enjoying the present moment only, as they do not often hybernate. A large portion of them make a great noise, and mess and spatter every thing they touch. Idly they buzz during the summer weather, over all the works of their neighbours; enter their chambers, leave the marks of their feet wherever they go, and carry about with them the odour of the graveyard or the dust heap. The same brilliant sun reflected in the tint of the emerald, the *ocellus* of the peacock; or the brilliant hues of a higher insect life, sometimes gilds the exterior of these flies. We fancy we see one now, its body is shot green, blue and gold; and round its head is a diadem of rubies. We see it alight on the putrefying corpse—The Imperial *Musca Cæsar*. When rottenness and corruption reigned in the Republic of Rome, and the conscript fathers were exiled from the putrefying state, and the morals and the coinage were prostituted for the benefit of the few, Julius Cæsar stamped his image on the decaying Roman "As" in place of the galley of free Rome. See him for a moment wrapped in his gorgeous robe, ascend the stairs of the Senate House! He turns his back on Pompey's statue!—he is gone. "*Musca Cæsar*" was a glorious insect compared with the "grubs" that proceed from him:—Julius Cæsar was a Noble Roman, when contrasted with the "maggots" his successors.

We have met with human individuals who resemble these flies in character; for one lived not far off. He always dined at his neighbour's expense when he could. He abounded in false jewelry, and all that could set off an insignificant person, devoted to the excesses of life. He affected every thing that was brilliant, and despised every thing that was solid, but made a great noise in his little circle, "more by clatter than wit." He showed a want of order and regularity; he never had clean hands, and never wiped his shoes. His visits were erratic, but he generally came for the day; and from his blue coat and love

of rare vintages, was at last nicknamed *Blue Bottle*. As long as he lived with his uncle, the sun shone on "Blue Bottle." The ladies excused his dirty feet, and nearly kissed the hands of the heir of Old Bottle. But when "Old Bottle" died bankrupt the winter came on "Blue Bottle," and he was broken never to hold wine again.—*The broken bottle goes to "the wall."*

"Daddy longlegs" (*Cteniphora pectenicornis*) did great injury to vegetation, particularly to the gooseberry bushes and other fruit-trees in his juvenile, or larva days. But now his legs are too long and his motions are too uncertain to do much steady mischief, yet he is already the parent of offspring which will show a strong family likeness to his juvenility. He is a type of a member of society that one sometimes meets with, long necked, long bodied and long legged. His coat is ever open and blowing in the wind, like the two wings of this fly. His grotesque motions render him an object of ridicule, and he is perpetually "spitted" by those who criticise entomologically.

The gnat (*Culex pipiens*) is another "creature of a day" which is a great pest to the higher animals. In the early stages it passes much of its time in the water, which it assists in purifying. When in the winged state, by their great numbers they may sometimes obscure the sunbeams. The gnat may be compared with some writers in daily newspapers, who are capable of biting homeopathically, but whose bites occasion a short-lived inconvenience,—an irritation but for a day. The writers in newspapers are said greatly to contribute "to the purification of the moral atmosphere," but by their numbers they like a cloud of gnats, may sometimes cast a shade of obscurity on the horizon.

The horse-fly (*Tabanus*) delights in sucking blood, and few animals can successfully drive it away; hence many of the larger quadrupeds like to roll in the mud to render themselves impervious to its attacks. The philanthropist is also frequently obliged to plaster up himself and his purse to avoid being "bled" by a vagrant and hungry population. (See page 145.)

The humble bees (*Bombus*) so called on account of the loud noise they make, exhibit three sexes, and perform great feats. Individuality and combination with them are coincident, and they delight in labour. Unlike some of the insects of their order, they exert *themselves* to obtain food for themselves and their posterity, from the common field, by daily industry. They never rob the nests of their own or of other species. Each works hard, and like those men who do the same, and are provident, methodical and indefatigable, they enjoy wealth, and leave behind them substance sufficient for another generation. But the last generation of humble bees being born late in the autumn, has less power of saving for its posterity, than those

generations born in the summer. And so a few surviving females from a nest of humble bees, are the parents of colonies the following spring; like the last of a race of human beings, who has to begin the foundation of a new family. The cuckoo bee (*Apathus memorum*) is a hanger-on of the humble bee, doubtless useful to it as a dweller in its tent, as the Japhetic race is said to do in that of Shem. The researches of science are still insufficient to account for the connexion of races; and the precise relation to each other of the humble and "cuckoo bees."

The honey bee (*Apis mellifica*) carries method further than the humble bee; as the constructor of hexagonal vessels, it teaches man the most perfect method known of packing liquids, cubes being unsuitably angular and liable to fall to pieces. The hive has been the type in all ages of a thriving industrious community. The working bees are said to kill the drones or perfect males when they are too numerous, or are no longer needed. In which they show analogy to the Amazons whose husbands were killed when they did not want them; as described by Justin and Diodorus. Bees being governed by their Queens, are certainly a type of female monarchies. The high order of instinct possessed by the bees, and exemplified in the management of a hive where the female sex has the predominance, throws great honour thereon. A well ordered hive, illustrates the British form of government; which is as far in advance of the male monarchies of the Continent, as the honey bees's hive is before the home of some other divisions of the hymenopterous order. Female government among insects is exceptional, and is only useful amongst creatures consisting of three or more divisions in their society; typical of our Queen, Lords and Commons. The drones cannot be done without in the government; but on the working bees and Commons, depend the supplies.

China is a hive incessantly occupied; she copies with marvellous regularity what she has done before, with a precision unknown in higher races. They acknowledge so far as we know, but one head in general; yet the overcrowding of the Chinese hive has of late years developed a tendency to swarm, and a refusal to submit to the head of the hive. What the pressure of stronger nations from without may effect, remains to be proved. Were the inhabitants of the Chinese Hive to be reconciled, they would have no difficulty in stinging any invader to death, particularly the "Russian Bear."

The genus *Vespa* is an extraordinary one, displaying much yellow and other bright colours. They are very ingenious, and are our instructors in *papier mâché*. This paper is formed prin-

cipally of the bark of trees, and where they can get it they are fond of the bark of the mulberry, with which they build their curious habitations. They are omnivorous; honey, flesh, living or dead, the tiny insect, the expiring giant, can be pinched alike by their mandibles. As we approach, they show signs of hostility, and occasionally sting when we come too near. They are the analogues of the inhabitants of Japan, who teach us so many new applications of paper, which is so much used in their dwellings. But they are so treacherous and spiteful that it is difficult to keep on good terms with them, and we sometimes feel inclined to smoke them out, as we do the wasps, with the flowers of sulphur, charcoal and nitre.

The hornet is a large insect of the wasp family, but is not nearly so numerous as some of the smaller wasps, yet it is much more powerful and more dreaded. They are insensate and inveterate in their attacks, plundering as they roam. If the bees and wasps are types of the Chinese and Japanese, the wandering hornets may represent the Malay race, their allies, who are of a more roaming disposition. Hornets are stronger than wasps, and the Malays are more powerful individually than either of their more civilized brethren of the Mongolic race. Their depredations also are more conspicuous where they are in force. The hornet has his place as a scourge of nations; as a means of extirpating those appointed to destruction. A few millions of hornets would be formidable indeed. These Hornets once drove out the "Hivites," to clear a land flowing with milk and honey. (Ex. xxiii. 28.)

The ichneumons are a large order of four-winged flies, which prey upon the bodies of living insects. Some species with their long and sharp ovipositors, pierce the skin of living caterpillars, and lay their eggs in the body of the animal. These eggs hatch and yield minute grubs, which are sustained on the substance of the caterpillar: it grows lean as they grow fat. It is ravenous, but its food being put into a bad skin, does not nourish it as a healthy animal. At last it crawls to some sheltered spot, where if not too far gone it cracks its skin and discloses its chrysalis, from which a perfect butterfly can never rise. It may preserve its form till spring, but if broken, little cocoons of silk are seen within it, out of which arise small four-winged flies; pretty in themselves, but not the expected butterfly. Many of the brightest flowers are blasted by nipping frosts, so that they never bear the fruit they promised. A man of genius cut off by follies or circumstances, may never reach the starting-point he looked for from this world. He never can produce or execute what he had planned; or what is suited to the character of his mind; or what is worthy of the fine qualities

he possesses. He may be infested by some artful parasite, who understands his weak points, and knows how to turn his strength to his *own* advantage; and how to reap the reward of his labours, and through them go down to posterity, without perhaps leaving him the skin—the shadow of fame.

The ruby fly (*Chrysis ignita*) glows like a winged gem, reflecting the purest glories of Iris, azure, gold and the brightest carmine—a celestial combination,—the lights of the insect day. Their form, their colour, their rapid motion, cause them to be considered the most exquisite objects in the insect world. They are parasitic in the wild bees' nests. They ornament flowers, like the humming birds of the tropics; and like them flit away and are lost to sight in a moment. Our joys are often like a sight of this insect; brilliant, shining, commanding our whole hearts, and our imagination gilds them with all the glories of an evening sky. The blue of heaven then takes a purple cast, and the yellow light but enlivens the green vegetation. We warm at the sight, and all our language cannot paint our emotion. Such are the colours of a landscape illuminated by the setting sun—a brilliancy that cannot last, "the throbs and throes of an expiring day." The insect is gone—*our glow is chilled* by the dews of evening, and we awake from a delightful vision.

The ants are numerous, powerful, and show more intelligence than any family of insects. Incessantly they labour for the accomplishment of their ends. They have more power of accommodating themselves to circumstances than bees or wasps. Rills of water do not stop them. If the soil be soft they make a tunnel underneath the stream to pass through; if the soil be hard they make a bridge across the stream. Not deterred like brave men by the loss of a part of their number, they apparently consecrate their lives for the common good; knowing that their bodies form stepping-stones to another land. When they are in fear of being swamped by an inundation, some kinds dam up their nests to keep out water, and in one case, a species built a wall of mud, partly round some millet seed left by the receding tide, apparently as a preserve for their nest not far off. They are the most orderly, brotherly, active, strong and diligent of insects, eminently co-operative and democratic: they must have self-government. They are particularly clean, and fond of their offspring, which they tend with the greatest care. When they once lay hold, they do not easily let go. They have numerous domestic animals; beetles or scavengers and *cocci* and *aphides*, which have been compared to dairy cows.

They are often rich in stores of provisions. We consider them a type of the Dutch nation.

The wood ants are a large species, but being in smaller communities than other ants, they accomplish less. They are huge feeders and till lately were the great makers of formic acid. Ants are pre-eminently ingenious, and are apostles of industry and thrift to all mankind. These smaller communities of ants, have their nests plundered by birds; such as the domestic fowl, which is glad to feast on their eggs. This shows analogy with the small German states whose territories have been curtailed by the French—the "Gallic cock."

Slavery finds its analogy in the habits of *Formica rufescens* and *F. sanguinea*,—according to Pierre Huber. The first appears to be unable to exist without the aid of slaves of allied species. Its males and females are entirely devoted to propagation, while the workers are wholly employed in slave hunting; for they cannot make or repair their nests or feed their larvæ. When the increase of the inhabitants of the nest demands a migration, the faithful slaves may be seen dragging their masters to the new abode. The ruling populations of some tropical countries are almost equally dependent on subject races, who procure them food, and supply their various wants. Those ants which attend upon the ruling species are neuters,—analogues of the dark Eunuchs who serve in many Eastern households.

The sawflies are ingenious mechanical constructors, the tailors of the insect race.—They are very prolific. The caterpillars are especially beautiful and resemble those of moths. Other insects use a knife-edged instrument for cutting: these use a saw; a step in advance, like that by which the savage workman passes to the civilized. The sawfly resembles the more scientific workman of Europe, as contrasted with the imitative workman of China; typified by the bee. The caterpillars, the principal workers; show an affinity to an order more generally admired—the butterflies and moths—or *Lepidoptera*.

The caterpillar of the little *Tinea* or clothes-moth, burrows in, and destroys what many most value. The clothes in which they wish to hide their nakedness, to cover the little that is in them; for oftentimes "the gayer the clothing the emptier the mind." It is part of a great analogy, that our "filthy rags" should be destroyed, as we ourselves are by worms; in order that being naked, we should be clothed with new garments. The Tortrices embalm themselves in leaves, the beauty of which they destroy, but which enclose the germs of a higher life; another argument for the lower, being made principally for the higher.



HORSES ATTACKED BY GADFLIES.

See page 140.

The *Noctua* the most truly nocturnal as a class, are more commonly dull coloured than most of the moths, and harmonize well with the gloominess of night. Some genera are most brilliant in colouring, and wonderful to relate, have *metallic* Greek and Hebrew letters on their wings. This dusky genus of moths, that fly principally during the night, illustrate "the dark ages." And the families (*Plusia* and *Noctua*) ornamented with Greek and Hebrew letters on their wings, may represent the cultivation of these languages in the middle ages; which contributed so much to the enlightenment of individuals; and may be compared with the gold and silver characters which shone in the manuscripts, executed at this period of obscurity. The cultivation of these languages, and the illumination of works in them with gold and silver characters, were pursued amid the gloom of convents and monasteries. These slumbering embers of light, prepared the minds of men for the reception of the clearer daylight of truth.

The *Bombyces* are twilight moths; more robust in body and shorter in neck than the *Noctua*. They are brilliant in colour, many of the species being apparently attired for the *soirée*. The males are particularly susceptible of the charms of young females of their species wherever found, and are often caught in this way. In this they differ from moths of a colder nature. The presence of a young female, is sufficient in many cases, to induce them to enter a house which they never leave alive.

Some of the *Bombyces* prepare a silken canopy for themselves; a beauteous couch to be stained as the insect leaves it. This is of more value than any of the works of the insect, and serves to atone in the case of the caterpillar of the mulberry, for much destruction done to the leaves of the fruit-tree. As the producer of silk after its working state is over, it is the most precious of insects.

"The good that men do lives *after* them,
The evil is oft interred with their bones."

The humble silkworm illustrates a phase of man's life. Like the child, in its early stage, it does little else but eat, and only stops to change its skin or clothing. When it has eaten its fill, it longs to do something for posterity. Its silken covering, wrought with so much care and labour finds a place at court; among the streaming banners of victory; the pageant of holiday or the parade and mockery of mob law. It rustles through many a noble hall or church aisle; and its cracked voice, escapes from the electric machine. The caterpillar may well labour for such a reward; the man may well work with him for such wages; but the man alone can fully appreciate a compact;

he alone can sound the depths of the moral law. Viceroy of the Organic Kingdoms, he on behalf of his subjects pays wages and receives debts. The reward of works is various ; it may be immediate ; it may be deferred. It may blast from a trumpet ; it may be unobtrusive, perceived by few, but the giver and receiver ; it may benefit the individual or his posterity. Such a reward should satisfy the hard-working man, who perhaps spins all day in a dull corner ; he is not working for himself alone, he is contributing his quota to the market of labour, and sooner or later it will be rated at its value. With the eye of faith or imagination, he sees his work done ; the fruit that springs from it, and in the happy dreams of the tired labourer clasps the reward.

We do not often consider how man is as dependent on the lower as on the higher forms of life ; how the well-being of nations hangs on the fauna and flora of their habitations ; how the balance in Nature sustains the human frame. Begin with insects ; they demand a sustenance as justly as the higher mammalia. Insects as they flit from flower to flower carry that fertilizing dust, without which many a blossom, a bright new birth, a fragrant atom, would die and leave no seed. The world cannot bear unchecked vegetation. Man the chief gardener claims the choicest fruits ; monkeys and birds come next ; but ere "the debt of Nature is paid," the smallest insect, a day labourer in the paradise of plants must have its hire.

The sphinges justly called the hawk moths, are grand and soaring Lepidoptera. Poised over flowers with vibrating wings, they with their trunks, extract the honeyed sweets "on chaliced fount that lies." Although their wings are smaller than those of some members of their order, they are the most powerful in flight, and forcibly prove that depth of wing is not strength, but momentum is power. Excepting the humming-bird moth, and the "clear-wings," they avoid the noonday sun. Early in the morning we may see them suspended, on wings that vibrate like a flash of lightning over a bed of petunias, like "the coffin of Mohammed between earth and heaven," apparently without leaning to either. Breathlessly does the naturalist watch them for the few moments that they remain in view. They are gone. Whither ? To the flowers that saw their birth ; to the dark and gloomy recesses of the ivy ; perhaps to be the prey of the bat or the owl, or to remain until the day is past, and another hour of activity arises.

The death's-head moth (*Acherontia atropos*) shows how wonderfully man's structure is illustrated in some departments of Nature, and how life and death are intermingled.

Flying into the windows, the superstitious say, its shrill squeak "is the presage of plague, war and death."

The *Polyommatus* or blue butterflies, by their different tints of colour, show a resemblance to the various aspects of the sky, according to season and weather. The azure-blue (*P. argiolus*) is like the clear morning without clouds. The Clifden blue (*P. adonis*) is of the brightest and most glorious hue of noon. The large blue (*P. arion*) is of the gray of an autumn eve; and the mazarine blue (*P. acis*) is like the colour indicative of thunder. An exotic species is of a purple colour marked with rufous, like those clouds that,

"Streaked with dusky red portend,
The day shall have a stormy end."

The copper butterflies are magnificent insects in colour, and by their bright lustre, show an affinity to metals, without containing any portion of them. This appearance without reality, these wings which shine like leaves of gold, so lustrous, yet so short-lived; glorious like gems and yet having none of their enduring qualities, are not the less beautiful while they last.

"The same superior rays
Blush in the rose and in the diamond blaze.
We prize the stronger effort of His power,
And justly set the gem above the flower."

This brilliancy, this glory given to the insect, is an earnest to man of a more solid future, when the brightness of the surface shall be united to the substance of the cube, contained within the centre of the Eternal Circle. The higher we advance towards the more perfect butterflies, the more the analogy widens and deepens.

Some caterpillars feed on the lowly rush, the vernal grasses, or the lofty oak. Thus various in habits of life, in social position, when they sleep they appear in different coffins. Some are in a plain-coloured case without a spot of shining metal; while others in their death are ornamented with the gold, the silver, the copper and the iron of the age. The preciousness of the metal with which they are embossed, is not always in proportion to the brilliancy of the hues of the perfect insect. Those that are the plainest in their chrysalis state, may be adorned with gold in resurrection.

While we survey with pleasure and profit, the transformations of insects, particularly butterflies, as a passage from a lower to a higher life, we are reminded that the caterpillar stage is that for Working. A lean miserable caterpillar never becomes a fine insect. Its principal food is eaten in this *primitive* condition; the larger it grows, the larger it will be in the perfect state; the

more serene its latter days, the more glorious will be the bloom of its new life. Let the prophet of its birth, address to it the inspired words of Rogers.

"Child of the sun! pursue thy rapturous flight
Mingling with her thou lov'st in fields of light,
And where the flowers of Paradise unfold,
Quaff fragrant nectar from their cups of gold:
There shall thy wings, rich as an evening sky,
Expand and shut with silent ecstasy.
Yet wert thou once a worm; a thing that crept
On the bare earth; then wrought a tomb and slept.
And such is man; soon from his cell of clay,
To burst A SERAPH in the blaze of day."

The Neuroptera are not very powerful on the wing, if we except the dragon flies. Their wings are more transparent than those of butterflies, and they all prefer marshy, stagnant districts, where decaying vegetation is most abundant.

The caddis flies are curious in the larva state, working within cases to which they attach shells, pieces of stick and straw. These serve to hide and protect their tender bodies, from the attack of the perch and eel. They thus fortify themselves against their enemies; some species preferring stone armour and others wood. They are like the two schools of naval engineers; some of which give the preference to "wooden walls," and others to those of Stone.

The "lion of the Aphides" (*Hemerobius*, Linn.) has brilliant shining eyes, but such a foul smell, that although so very small and delicate it is loathsome. We see individuals of this description in large towns, small, thin and delicate, with sparkling eyes and a tinge of green about their complexions—the green of canker, not "the green of youth."

The dragon fly has eyes that shine like opals and wings more transparent and delicate than the finest tissue of man's art. It carries a formidable-looking pair of forceps at the end of its body. The eyes after death lose their lustre and the refulgent hues of the body are seen to lie beneath a transparent skin, upon a flesh that soon withers to a sombre hue.

When the former life of the dragon fly is inquired into, we find its eggs laid amongst the rotting weeds, in the stagnant pool that smells of sulphur, or the ditch as black as Styx. Its ravenous larvæ are kept in check by the "water devils" or larvæ of *Dytiscus* which often get possession of them. In the pupa state, they creep upon the reeds. The caterpillar of the butterfly becomes a glorious insect after its sleep, but the larva of the dragon fly, once the companion of "water devils," dwelling in the sulphurous stench of the marsh, in its resurrection may be compared with the RE-ANIMATED, but evil man.

The ant lion (*Myrmeleon formicaleo*) is an extraordinary insect. In its larva state it forms a pit in the soft shifting sand, from which it removes every stone or obstacle, that might prevent the fall of the sand on all sides towards the centre, at the least touch of an ant or small insect. It is sluggish in its motions, and at the bottom of its den partly buried in the sand, watches the approach of an ant. The little insect slips at the margin of the pit, perhaps struggles as it falls, and stopping half way down it receives a shower of sand from the ant lion at the bottom. The sand rolls down bringing the ant with it, which is seized by the lion; its veins are torn open and its juices are exhausted; it is then cast a shrivelled dry carcase out of the den.

Turcoman tribes watch in ambush the approach of travellers. Once in their clutches there is as little hope for the travellers or their property, as there is for the ant in the den of the ant lion.

The spider catches moths, flies and winged insects in its web. The ant lion catches insects without wings. They may both illustrate evil powers. The typical spider entraps the spirits of men: the metaphorical ant lion, his body and purse. Both these animals show untiring industry. The ant lions make their pit smooth on the surface, that the unwary may suspect nothing. Those men who feed on the substance of society, smooth the path of their victims to destruction.

The *Orthoptera* so important as scourges of the vegetable world, are amongst the most numerous as insects, thought not so great in variety of species.

The *Locusta migratoria*, common throughout the East, takes first rank as a destructor. As was said in the introduction to this chapter, it is the locust that is "God's great army, before which the land is said to be as the garden of Eden, but behind them is a desolate wilderness." Eating in all stages, they are most destructive in the larva state. They were before compared with the Mongol roving hordes and like them they are more devastating at an early stage of their history. When the locusts have wings, they may be induced to fly away from a neighbourhood, but when they have no wings they eat as they march: in this they show analogy with the mounted and dismounted Mongols.

The ravages of the Mongol are not yet for ever passed away. The "rose of Sharon" must be watered with Mongolic blood; as the oases of Persia and Arabia, are fertilized with the carcases of the locusts. (Ek. xxxix.)

The grasshoppers (*Gryllidæ*) are a light, merry, jaunty family of insects, singing throughout the summer; but dying in winter, they leave their eggs in the earth "in faith of a future spring."

These are like the seeds of our ideas, laid at first in cold ground which "the shining sun of hope" calls into life and further development. After all their various transformations, the grasshoppers bound among the green luxuriant leaves that cover the Earth.

The cricket is another merry insect particularly at night. We remember watching the field crickets at the entrance of their holes, waiting to devour any small ant, spider or beetle that came within their reach. These they seized and tore piecemeal, like beasts of prey, singing all the while, "Like men who could smile and murder when they smile."

The mole cricket (*Gryllotalpa vulgaris*) has a hand like that of the mole, which somewhat resembles man's. The power they have of digging in soft earth in search of small insects is marvellous. They dive deep into the earth in the daytime, and come abroad at night. They are ferocious insects and seek their prey in the lowest haunts, but fly at the least touch of the black coat of their persecutor the mole (*Talpa europæa*). These have their prototypes in thieves and police; the one showing great ingenuity in the commission of crime, the other in its detection.

The *Mantis religiosa* or praying cricket according to a writer of 1780, suggested "the attitude of prayer." But this attitude is nothing more than that of an insect of prey. They are exceedingly pugnacious, and are kept by the Chinese as other nations keep fighting cocks; the sharpness and power of their fore legs being extraordinary. They tear one another to pieces, fighting desperately until one is decapitated, and then the survivor devours it. The attitude of these insects, has suggested their name, but it is the order of battle, and should represent a war; nominally on account of religion, but in reality for gain. The worst passions are often roused, on a ground said to be religious; but true religion has as little to do with the controversy, as has the attitude of this insect, with what it is said to represent.

The walking leaves (*Phyllium*), are a curious connecting link between the animal and vegetable world. They, with the spectres (*Phasmide*), are the most wonderful of insects in appearance. They are doubtless formed and coloured like the plants among which they are placed, so as to deceive small animals and birds; as from their large size and helplessness they would probably easily be extirpated. An instance of the principle of compensation, which is always found to pervade every division of living organisms. Weak men are often fenced round with protecting armour; or their very insignificance causes them to escape notice. Others be it observed are protected by their

peculiarities, like the hedgehogs among mammals, or the toads among reptiles, while some, like the insect "walking leaves," are overlooked from a modest wish on their parts, to identify themselves with what surrounds them, yet like the insect, they may possess an innocent beauty, which "vegetates" as it were, near the place of its birth.

The cockroaches (*Blatta orientalis*) so disgusting to most Europeans in appearance and odour, are looked upon as exotics from the East. They eat ravenously in all stages. In the United States of America, they are more abundant than in this country, and occasion greater disgust. In the West Indies they are less obnoxious, being suited to the character of the climate. The Yankees would gladly get rid of them. "Cursed be the ships that inflicted these black beetles upon us" (say the New Englanders). "They came at the same time as the 'Irrepressible Nigger;' let them both go together."

The Homoptera, parasitic on our vegetation, are great pests among our small insects. The variety of species is great, and they are of many colours. Their excrement has a sweet taste, and contains much sugar; on this account their haunts are frequented by some species of ants. Such show an analogy with the labouring population in sugar-producing colonies, who are kept by European nations for the sake of the sugar they aid in procuring. They are black as Negroes; yellow as Chinamen; brown as Malays; or dusky as Coolies. Those who confine their sympathies to one race may dislike them, but these are often least willing to do without their sugar.

The parasites of the animal creation, are repulsive to most of us. The lowest animals are not free from them, and the *lowest* men most *abound* in them. Every animal has something to give away. The Mollusca have their attendant mites which at first come to feed on their *débris*. The moths, the butterflies, the bees, the beetles all have their *acari* or parasites. Fish, reptiles, birds, whales, quadrupeds and man, are all infested with a variety of creatures, which adhere to them in a most tenacious manner; some being furnished with little hooks on their feet, which renders them most difficult to shake off.

Many parasites that infest man, can exist away from him, perhaps all can, and are sent to warn him to use his knowledge of natural laws, by which he can make their situation untenable, so far as he is concerned. He should conquer in this manner his own evil desires and inclinations, so far as he has the power. The "water of life" has the same cleansing power over the moral man, that frequent ablutions have over the physical; driving away parasitic sin, even though it should cling with "hooked feet" till death.

The moths that float through the air at twilight and on "the green turf seek the honeyed flowers" are attended by a minute hexapod, which seeks the most downy recesses, where their wings join their bodies, to suck their juices.

These moths illustrate a dubious class of females who jostle passengers. The butterflies among Lepidoptera, have also their parasites, as have the "Butterflies of Fashion;" who however have no sympathy with the moths of the "*Demi monde*."

We admire the character of the bees, more than that of the moths or butterflies, notwithstanding their frequently brilliant colouring, and the exquisite taste of their attire. Bees are not without their followers. Some of their own order are quite willing to live at the expense of the rest; such as *Apathus* and *Nomada*. Several flies (*Volucella*) also devour what the bees have prepared with so much labour. Large moths are glad to spoil the bees; and birds and quadrupeds prey largely on them and their industry. The minute insects that infest the bees, so rich in the spoils of vegetation, are often found on the flowers visited by them. These tiny parasites find an existence, easier in connexion with the bee than with the plant; but are capable of living on the plant alone.

The comforts of life, reward the industrious man; but those who are unwilling to exert themselves strenuously, to obtain a subsistence by industrial employment, sink into loathsome dependence. Pauperized by indolence; some subsist on the unwilling bounty of private individuals, while others feed on the resources—the very life-blood—of the State. These the State would gladly but *cannot always shake off*: yet we should always bear in mind that Human and animal parasites may, by the *judicious* arrangement of the classes on whom they feed, be induced to seek other forms of sustenance.

The Acari parasitic on beetles, are very prolific. They differ from those which are attached to bees, and accommodate themselves to the grosser habits of the beetles.

If beetles themselves have their analogues in various trades, so their parasites may represent the hangers-on of each trade, who subsist on the more industrious, and are burdens to them:—as the gleaners are on the farmers, the collector of shavings on the carpenters, and the marine store dealers on orderly households.

Birds are not free from parasites. From the "lordly eagle" to the swallow, the pigeon and the partridge, each has a species adapted to the genus. Those that "pierce the clouds," those that cleave the waves, and those which whistle on the hawthorn hedge; all illustrate life within life;—one form dependent on another;—the lower on the higher. These little creatures

ascend with the birds on their loftiest flights, and descend with them to the depths of the sea.

Quadrupeds abound in hexapods and ticks, which are their monitors to cleanliness and attention.

Man has his friendly tormentors, which "feelingly persuade him what he is." These he endeavours to get rid of, and he is thus relieved from much that his own ignorance has caused. The wise do not so much need advice, as those who from folly are unwilling to receive it. MONITORS ARE GOOD TO THOSE WHO NEED THEM, BUT IT IS A FAR HIGHER ATTAINMENT TO DO WELL WITHOUT THEM.

CHAPTER VI.

MORAL SIGNIFICANCE OF FISHES.

DOG-FISH—SHARKS—ANGEL-FISH—TORPEDO—SKATE—SWORD-FISH—GANOIDS—
 PIKE—PERCH—MULLET—GURNARD—STICKLEBACK—MACKEREL—TUNNY—
 JOHN-DORY—ANGLER—FLYING-FISH—PILOT-FISH—GUDGEON—TENCH—
 SALMONIDÆ—HERRINGS—COD—HADDOCK—FLAT FISH—REMORA—EEL—
 PIPE-FISH.

FISHES as a class appear to be typical of a stage in the life of Man as an individual, for before his birth he swims in liquid. They are also illustrative of the early history of some nations. The Teutons passed through various transformations. They adopted at first an aquatic mode of life, which we may call their *fishy state*. In a more advanced stage they were still maritime in habits, but their society was more highly organized. This is illustrated by the whales and seals, which are aquatic mammals—a far more advanced type than the fishes.

Water is life to the fish, as well as to the mariner who like the fish does not enjoy life long on land. The ocean is the home of the sailor, and while at a distance from it, he shows the strongest yearning towards rivers, lakes and ponds. Many a human inland population, notwithstanding its distance from the sea, still loves the water.

The spotted dog-fish (*Scyllium canicula*) is the most common species on our coasts, and deposits its eggs amongst seaweeds. The eggs are furnished with spiral tendrils at the four corners, which curl curiously round the seaweeds; by which the egg is retained in a safe position until the young animal is hatched. It is fortunate considering the voracity of this class, that they are produced in small numbers; only a few eggs being deposited at a time. The females are larger than the males amongst the sharks, as in birds of prey. These dog-fish swim in shoals, and attack most of the small fish, jumping after them in a bold and furious manner. The superiority in size and boldness of the female fish, suggests analogy with the "Fishwives" whose violence and impudence are proverbial.

The shark tribe is piratical in habits, and we cannot illustrate human sea robbers better, than by comparing them with sharks. The greatest number, most powerful, cruel and rapacious of these pirates, frequent other waters. But we have "petti-foggers" in our own seas, who rob the fisherman's crab-pots, and are frequently caught in the very act. They are justly punished by him for they spoil his nets. Such are however less serious than some of his other adversaries, who prey on the fish in the fry state.

The white shark (*Carcharias vulgaris*, Cuv.) is a rare visitor to our shores. According to Grew and other early writers, it was in former times more commonly found on the coast of Cornwall than on that of other parts of England. A type of the wreckers, who were more frequent on the Cornish shores than elsewhere. The shark is however a creature of tropical climates, being rare in temperate latitudes. Mariners have a greater dread of this species, than of any kind of marine animal.

The mouth of the shark opens very far below the nose; and the eye has a horrid expression. The teeth are sometimes two inches broad; and are set in six rows, one without another so as to be capable of instantly biting a body in two; or of swallowing a man whole. Every tooth of the shark has an *independent motion*; lying flat when at rest, but is erected at will for grasping its prey. The Pirates of the American seas are of this character. They obey a leader—analogueous to the will of this creature, yet each preserves much independence. These are "white sharks" of the Semitic-European race, and are by far the most formidable of their class. They should be caught and slain without much mercy or exception.

The hook for a shark is usually baited with a piece of salt pork, a suitable bait for a creature of gross and savage appetite.

The blue shark (*Carcharias glaucus*, Cuv.) is another species that visits the Cornish and Devonshire coasts; committing great havoc amongst the nets of the fisherman, which it apparently delights in tearing with its teeth, and tangling so as completely to destroy the net; often however being caught itself. These sharks sometimes swallow the nets as well as spoil the fish of the fishermen; injuring them as effectually as those foreigners do; who plunder British fisheries, but are themselves at last caught by the Coast Guard.

The hammer-shark (*Zygæna malleus*) has an extraordinarily shaped head, and eyes on its two sides, which give it a most strange aspect. Amongst the sharks we see the representatives of different trades. There is the sawfish or carpenter. The hammer-shark, or blacksmith, and the fox-shark or thresher

(*Carcharias vulpes*, Flem.), which flaps or slaps the whale with its "caudal appendage."

The Greenland shark (*Scymnus borealis*, Flem.), is said to bore holes in the whale, as large as a man's head. This creature we will compare in our account of the Greenland whale to the numerous enemies that attack the English Constitution. They likewise have analogues in the pirates of the northern seas, which some hundred years ago preyed on commerce.

The sharks in the Oriental Archipelago and Pacific oceans are the most dreaded. Many lives, annually fall victims to their attacks. The West Indian pirates we compared with the white sharks, and we now see analogy to these sharks of the Polynesian and Chinese seas, in the Malay and Chinese pirates. These are sometimes called "white sharks," for they are lightish in colour, but of a different shape and contour from the *Carcharias vulgaris*; yet they are hardly less to be feared.

The angel-fish (*Squatina angelus*, Dumeril) is called by some the devil-fish, and by others the monk-fish. It is one of the ugliest of its class, and is held in much less esteem in England than it used to be. We question if it is not wholly unknown at our tables. It frequents the bottom, feeding on the flat fish. A habit characteristic of one of its godfathers the monks, who chose low rich lands for their dwelling-places, and fed on the little *souls*, and other "small fry" that fell in their way. The Turks treat this fish with more wisdom than we have done: they turn its skin into shagreen and use it for polishing. The monks formerly did some good in *smoothing the rough edges of society*. Those who are much opposed to their influence call them "Devils," while their admirers call them "Angels."—Let us call them "Monks."

The torpedo or electric ray is a rare visitor to our coast, but several species are commonly found on the Mediterranean and Atlantic coasts. They have been famous for giving electric shocks, even from the days of Dioscorides the physician of Antony and Cleopatra who thus early used electricity in medicine. Its extraordinary powers and structure, have been made the subject of numerous memoirs. The construction of the electric organs is analogous to that of the "Voltaic pile." The peculiar fluid secretion of the fish mentioned by authors, represents the diluted acid of the battery; as the electric organs of the creature do the positive and negative plates. It is a slow-swimming fish, and is said to keep at the bottom of shallow water, near the shore, and to kill or subdue its prey by a galvanic shock, before it is devoured. Those creatures that come in contact with it as it lies in shallow water,

receive "a discharge." This suggested the marine explosive bombs called torpedos, which are placed in the shallow approaches to a strong fortress, to destroy the bottoms of invading ships that touch them.

The habits of this fish, are suggestive of the use of engines, not calculated on by the superficial. They are like spiritual influences moving in the "sea of life," that are only likely to injure those going into "shallow water."

The long-nosed skate or shagreen ray (*Raia shagrinea*, Mont.) is amongst the commonest as well as the ugliest of fish. It is provided with curious crushing teeth analogous to the grinding rollers in machinery. It is voracious and ferocious in its attacks on small fry, and struggles desperately on the hook when caught; and the spines of the adult fish render them unpleasant to handle. They deposit eggs with four projecting beaks which are called "sea purses."

The skate is admitted in Normandy, as the type of a flat-faced woman. Those who fall in love with such an one, find if they catch her that they have hooked an "odd fish," who gives them much trouble, and is difficult to manage with ordinary means. A large skate may drag the captor overboard to the loss of his life. A powerful woman—a "typical skate," may drag her lover *into that sea where reason is drowned*. If he does succeed in landing such a "skate"—or such a woman, he finds her a "thornback" all his life. To be in the mouth or in the power of a large species of skate, is a very awkward and painful position, as bad as being in a shark's mouth.

The sword-fish (*Xiphias gladius*) has been famous from ancient times. It stabs furiously with its sword, whales many times its size; and even runs this weapon through the timbers of a ship, which it is supposed to mistake for a whale. The sword-fish has its analogue in those Navigators who from their boldness and desperate courage, attack with little deliberation, all they meet.

The ganoids were the characteristic fishes of an age which has passed away. A few species only, are at present known. This class which formerly contained so many species, is typical of nations who wore armour, and were more common formerly, than in our days. Those now living of this class of fishes, illustrate ships of war and peace; calculated by the mere strength of hull to resist attacks. The sturgeons especially, being stronger in their external covering than in their ribs, resemble many of the vessels of modern warfare, in having a less powerful framework than their outside plates. We ask what these *armour plates* on vessels are for?—and are answered to protect commerce from the attacks of enemies who would prey on it; as

the numerous voracious fishes would on the sturgeon, helpless without its armour.

The box-fishes (*Ostracion*) are incapable of moving rapidly, being enclosed in a coat of hard plates, nearly impenetrable to the attacks of ordinary fishes. Their tails and fins, are the only parts except the lips and eyes, not of the same rigid inflexible structure. They are fish in armour, and like the knights of old, awkward in movement. The American species (*Ostracion triqueter*), is reckoned the most choice fish for the table, of any found on the coasts.

These fish have their analogues in the turtles and armadillos. The turtles in particular shew analogy to the plated ships, which like them are cumbersome and awkward in their movement through the water. The sturgeons are like our "Warriors;" while the box-fish that are completely plated, are more analogous to "shield ships" of the American build, which are slow in motion and broad in beam.

The globe-fish (*Tetrodon*) is most singular and well worthy of the name of "Odd." It is covered with spines on its globe or cushion, a ball showing a resemblance to some species of cactus. The spines are sharp, and in one species they reach such size and sharpness, as to entitle it to the name of the "porcupine of the sea." These spines they can erect, showing a strong analogy with the hedgehog; and floating on the surface of the water inflate their large globe with air. No other fish ventures to attack them, so they return to their natural shape, and sink to the bottom. These are generally fishes of the tropics, but sometimes stray to our shores. They exemplify to us those seafaring men, who from their good nature would be stripped and plundered, did they not possess some external means of protection, from which their enemies shrink. If the porcupine is a type of the journalist of the land; this "sea porcupine" is that of "the press;" used in the protection of marine interests.

In our day the Ctenoid order, is much more extensive than the Ganoid. The pike (*Esox lucius*, Linn.) is a fish famous for its boldness and gluttony; eating ravenously and even attacking man, when pressed by hunger. It will sometimes bite animals that come to drink, with such ferocity, that it has allowed them to draw it out of the water, before it would let go its hold. The Pike is a type of the savage, greedy "middleman" or overseer. Like it he has perhaps an underhung jaw. He takes firm hold of his victim, and gets what he can out of him or her; nominally for his master's benefit.

These fish and their human types, were formerly much *esteemed* and were even thought necessary to the establish-

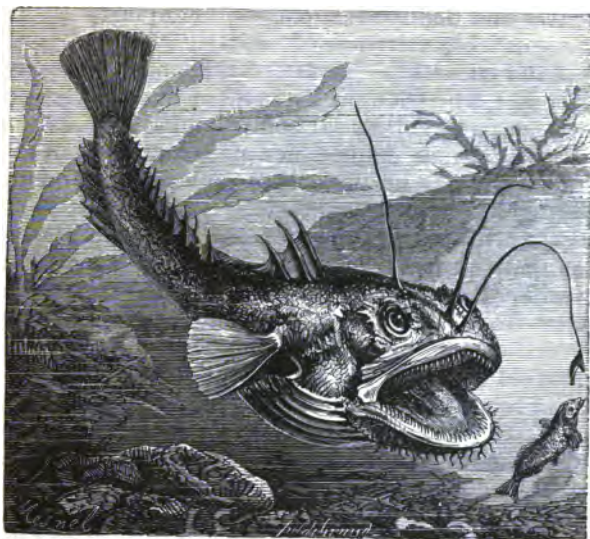
ment of every great proprietor. The pike was valued at double the price of "a house lamb" in February, in the days of Henry VIII. The "Messrs. Pike" were very fierce in those days, and are not quite extinct in our own. Pikes excite less attention now, from so many other fish being in request, of a less vicious character.

The perch (*Perca fluviatilis*, Linn.) was well known to the ancients, as also to the present inhabitants of almost every country in Europe, being found abundantly in most lakes, rivers and streams, throughout the northern and temperate parts. It is a bold biter of the young angler's bait, and easily accommodates itself to the smallest ponds. They are immensely prolific; yielding, according to Mr. Yarrell, 280,000 to the half-pound weight. The perch is a stout-bodied fish, and most brilliantly coloured.

It is fortunate that the finest races of human beings are the most fertile. Some families among the Semitic-European race are like the perch, pretty in complexion, but short and stout in figure, lively and "easily caught," yet by no means the highest or noblest of their order. The habit of sending out *Shoals*, is used in Gen. xlviii. 16 (*margin*) to illustrate the mode of increase of the children of Ephraim and Manasseh, who were to possess a fecundity analogous to that of fishes; which exceeds that of any other class of animals except insects, and still lower forms of life.

We see in the shark and fishes of its destructive class, scantiness of multiplication; and in the Ctenoid fishes the reverse. Usefulness is in proportion to abundance, and the contrary in these cases, although the cause does not exist here exactly *in prolificacy*. It is to the less prolific classes of animals, that we look for examples of *individuals* possessing the greatest amount of weight and influence. Human families that increase most rapidly, are not commonly so distinguished in their individual members, as those who increase more deliberately, and with more attention to consequences. But this is an *inner* type, and does not affect the truth of what was before said—That the highest races of man are the most *prolific*; and that the more useful fishes are the most *fertile*.

The great weaver (*Trachinus draco*) is famous for the severe scratches, it gives to any one carelessly handling it; and has been much dreaded for its supposed venom, both by ancient and modern fishermen.—It has however an excellent flavour. Even amongst fishes, there are poisonous and venomous species in all seas. Seamen of bad character "poison a ship's crew," inflicting injuries on all with whom they come in contact: and such are found wherever ships swim. Yet when kept under



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THE RED GURNARD.

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M

strict control and deprived of offensive weapons ; may produce food for respectable members of society.

The red mullet (*Mullus surmuletus*, Linn.) was highly prized by the Romans, who thought that one of the greatest privileges of life, was eating mullet. It sold for an enormous sum when of a large size, being many times more valued than its weight in silver. It is a beautiful fish in appearance, and frequents the muddy parts of our sea-coasts. Its flavour is at once rich and delicate,—a combination not always procurable in food, either for body or mind. The flesh of the eel is coarse and strong ; while that of the whiting, is delicate but tasteless. The mullet from the combined richness and delicacy of its flavour, typifies the work of a first-class author, which is a great treat to our intellectual palate. Such should not be devoured in too great quantity, lest it should be brought forth in an undigested state, instead of assimilated for the benefit of the mind of the individual. An Epicurean appetite for literary food should be cultivated, as it involves the rejection of compositions of a coarse and gross character.

The gurnard (*Trigla cuculus*, Linn.) is a big-headed fish short in the nose, and is said to utter a noise when taken out of the water, resembling that of a cuckoo. It is very abundant, and if well dressed is good for the table, but this requires considerable art. Its fins are large and prickly, especially about the head. Its food is prawns and small crabs, which would be perhaps more valuable than itself,—could they grow into large ones. There are several species of gurnards of divers colours and markings, which remind us of a particular class of old ladies, well protected about the head. Some are grey, some are yellow and spotted, some are red from various causes. They are prickly to handle, as they are beset with pins, and require the aid of every art in dress, to make them relished by society.

The bullhead or miller's thumb (*Cottus gobio*, Linn.) is a little river fish. Its food consists of larva and the spawn of frogs ; it is easily caught. This fish is typical of the most rustic form of "Mr. Bull"—a miller perhaps, after whose thumb the head of the creature is named. These fish usually keep at the bottom of the water, and like the men that resemble them, are wide in the head. Without being exactly stupid, they are slow and heavy, unwilling to move away from their favourite haunts, which are frequently LOW.

The stickleback (*Gasterosteus aculeatus*, Linn.) is a little tyrant in our brooks and pools. The males in the breeding season attack with ferocity all the small fish that approach their corners of the ponds. They frequently engage in mortal combat with males of their species which they rip up with

their spines. The female constructs a curious nest for her spawn, showing analogy with other and higher orders, usually so distinct in habits from fish. The pugnacious sticklebacks, erect their spines like porcupines when they fight. Boars also whet their tusks; Insects prepare their stings; and Man his weapons. Although not placed in a ferocious genus like the sharks, yet they are not to be excelled in courage and boldness by any fish. Their efforts and conflicts appear puny, like those of little men, who however often fight to the last.

The mackerel (*Scomber scombrus*) is one of the migratory fishes, and forms a part of that shoal of plenty—"The Abundance of the Seas," which it has pleased Providence to pour into our laps. The different successions of fishes at diverse seasons, and their various migrations, illustrate the life of man.

These fishes do not wander towards the pole, to return to our shores in spring as was formerly supposed; but remain round our coasts during the whole of the year: spawning in the shallow water and retiring to the deep to expand in size. The young fish require the sun's concentrated rays for their development in their early stages; which remind us of the early forcing stages in vegetable life.

The growth of man's mind is similar. He first requires to see matters in a strong light, that ardour may be kindled, and strength gained in him. This is especially a necessary preparation for "the *launch*" of the young man into the "sea of knowledge;" without which he might soon "get beyond his depth."

The small fry of the mackerel seek deeper water, and can scarcely be discerned in the depths. There they grow larger, and at last come into shallower water where we enjoy fishing for them, and we profit by their long retirement, and find that they have grown in size and increased in value. If we are wise, we do not follow them when they go into the shallowest pools, to spawn amongst the weeds.

Men of genius are often thought to be "odd fish," and like other *fish* have their periods of retirement from observation. Then they should be let alone, that they may have leisure for the propagation of their ideas, to come forth in due time with *shoals of precious food*, of which SCHOOLS may partake.

The mackerel is a most beautiful fish in shape and markings, which latter are implied by its name. This fish is formed to cut through the water with great rapidity. It is a strong flavoured though favourite fish. They bite eagerly and greedily at a bait; a bit of the tail of a mackerel being a favourite.

A mackerel sky, an indication of foul weather, is beautifully variegated like the marks of this creature, which resemble the

colours seen on the sea and sky, blue, green, and silvery white. The dark stripes on a light ground, typify approaching tempest; although the sky may be at present clear and beautifully blue. The white waves of the sea below, are illustrated in the silvery belly of the fish. A piece of red cloth is said to be "a mackerel bait for a lady," in allusion to the facility, with which both the fish and the Fair, are caught by scarlet.

The tunny (*Thynnus vulgaris*, Cuv.) is a large fish allied to the mackerel, much in favour with the natives of Italy and other countries bounded by the Mediterranean. It is very gregarious, appearing in vast shoals in its native sea, but it is rarely seen on our coast. It greedily follows and devours smaller fish, and is often itself the prey of the porpoise; like its ally the mackerel. Creatures that *prey* on others, are themselves "a prey." "All that take the sword, are liable to perish by the sword."

The John dory's (*Zeus faber*, Linn.) name is derived from the French *adoré*, worshipped; while the generic name is that of Jupiter; and the fish itself, is said by the fishermen of the Adriatic, to bear the marks of St. Peter's fingers. *A series of associations appropriate to "the fish of St. Peter."* The head is large and ugly, and its whole shape grotesque.

The boar-fish (*Capros aper*, Lacépède) has a resemblance to a boar in form of head, as well as in bristling spines. It is strongly scented and distinguished for ferocity, in which it however yields precedence to the wolf-fish (*Anarrhichus lupus*). This last is more properly called "the sea cat;" which latter quadruped it resembles in character, form, and markings about the head. It has strong, sharp teeth, and knows well how to use them. Even if caught, it will greedily attack any small fish or crabs in the same net; out of which it often escapes; for it will cunningly divide the meshes of the net with its teeth. It is excellent food when the popular dislike to its appearance and character is overcome.

On board ship, we have often one or more individuals, who may be called "*sea cats*." They are cruel to those in their vicinity, even if shipwrecked or otherwise in great danger; for their natural savageness, is not subdued by calamity.

The fishing-frog (*Lophius piscatorius*, Linn.) is like a tadpole in shape, the head occupying a larger space than the trunk. It has two fins which act almost like feet, and enable it to jump up from the bottom and seize its prey; for being a slow swimmer it could not pursue it at a rapid rate. It has three spines on its head, capable of being erected or depressed at pleasure. The foremost of these has a curious leaf-like form, which acts as a bait, when the creature crouches down at the bottom of

the sea. It stirs up the mud with its fins and elevating its spines they attract small fish, which attempting to seize the seeming prey, are caught by the "fishing-frog." This animal shows extraordinary analogy to a successful fisherman. The stomach of the "angler-fish," is often emptied by anglers of the human species for their own benefit. This fish's mode of taking its prey, shows that creatures so repulsive in aspect, and tardy in motion, require the aid of artifice to secure a meal, which we see also exemplified by human fishers.

The tree-climbing fish (*Anabas testudineus*) is well known to ascend palm trees in search of food, supporting itself by its sharp spines, with which it can progress with ease, up perpendicular surfaces. They can remain *five or six days* out of the water, with the aid of their *pharyngeals*, which are constructed to contain a quantity of water, and drop gradually on their *branchiæ*, so as to moisten them sufficiently to support respiration. Thus singularly constituted, they are enabled to live out of the water, long enough to perform considerable journeys overland.

The inhabitants of Siam and India beyond the Ganges, husband their resources more thoroughly than most nations, by which they are enabled to withstand famines and drought; while the inhabitants of other countries, belonging to higher races, under similar circumstances, die as fast "as fish" in general do "out of water."

These fish are very pugnacious and are kept for fighting in Siam, as cocks were in England. And being taxed by the king's government, produce a considerable revenue. A savage source of profit doubtless, but suitable to a compound nation like theirs, and illustrated in the habits of this fish; which unites those of a quadruped with those of its own order.

The flying-fish (*Exocetus volitans*) is more graceful than the flying gurnard. It inhabits the Atlantic ocean, and is gifted with extraordinary powers, to enable it to escape from its numerous enemies, both among the larger fish as the Coryphæne, and among the birds. Flying-fish are supported for a few moments with the aid of their long fins. These so-called "wings" merely serve to break their fall, and the impetus with which they rise from the water, carries them on a short distance. This is disputed by some observers. The Coryphæne rushes through the water, and bounds out of it, after the flying-fish. The little flying-fish can fly two hundred yards, while the Coryphæne cannot go above forty feet between each bound. But as it glides through the sea at a rapid rate, at each leap it gains on the flying-fish, which seldom escapes at last; and were they not so very numerous they would soon be extirpated.

The skill of the commanders of small vessels, when in conflict with those of great ones, is usually exerted in efforts, to escape from their more powerful foes. Their ships are often crank craft, and were they of large size, could easily escape by flight, but their small size gives them little *lever* power over the waves; while the great length of the opposing vessels, gives them on the contrary great power over the same element. Their only safety lies in their small size, which sometimes enables them to retire into shallow water, where their enemies could not follow them. They may exceed them as much in size as the Coryphæne does the flying-fish.

The carp (*Cyprinus carpio*, Linn.) was introduced into England at an early period, and according to Izaak Walton is the "Queen of River Fish." It has been much admired for the table, but has of late years become less fashionable. They are remarkably tenacious of life, have a stout form, are wonderfully prolific, and can flourish in unhealthy ponds. That they were introduced from the Continent is certain, like our Saxon ancestors, who are entitled to the name of "Queen of Nations." They are fertile above almost every other Nation, stout in body and difficult to kill. They are voracious, and can live where other nations would die.

The goldfish (*Cyprinus auratus*), so familiar to most persons, was introduced from China where it is of less value than the common carp, which is so much more modestly coloured. In its vivid tints it resembles the attire of the emperors of China who are more gorgeously dressed, but have less energy and are more insignificant and less useful than European Princes.

The bleak (*Leuciscus alburnus*, Cuv.) yields a fine pearly dust from its scales, which is used to give to glass beads, the lustre of oriental pearls. A desire to possess the treasures of distant lands is very prevalent; genuine if possible, or *counterfeit* if these are not to be had. Many articles are valued in proportion to the difficulty in procuring them, or the distance from which they are brought. Oriental pearls are of this character, as contrasted with pearls of OUR own streams and lakes, which are purer and more delicate than those of the East.

The loach (*Cobitis barbatula*, Linn.) is a common little species in brooks, amongst the stones, which its dusky colour often resembles. This species is uneasy and restless in stormy weather, and has been kept in vases, for the purpose of indicating changes in the atmosphere by its movements; which are probably influenced by the electric condition of the air. The conduct of eels is similar in thunder-weather. Individuals amongst us are almost "human barometers." Some plants also, are nearly infallible indicators of atmospheric changes.

The pilot-fish (*Naucrates ductor*, Cuv.) is another creature, which shows analogy, to an occupation amongst men. The Romans said, that a fish which they called "*Pompilius*," was often the means of indicating the right course to a ship on a voyage, when that was doubtful. It had a Greek name, signifying "*companion*," and was reckoned sacred. The pilot-fish is a guide to sharks, as to men ;—acting the part of a jackal to the great fish of prey ; pointing out their food to them, and snapping up any little portions unworthy of their attention. It doubtless follows ships, for what it can get :—a sure type of the pilots of our own day.

The gudgeon (*Gobio fluviatilis*, Willoughby) is a greedy, bold little fish, biting at the smallest bait, with proverbial readiness. When about to angle for them, the fisher is recommended to scratch the bottom of the water with a rake, by which the soil is disturbed, and numerous insects with their larvæ, are exposed which attract the gudgeons in numbers to the spot. They typify human subjects, "easily caught" by trifling inducements, who eagerly rush towards any "field," where there is commotion or excitement.

The tench (*Tinca vulgaris*, Cuv.) was called by old writers the physician among fishes ; in common with whom, they can live almost anywhere. In the dirtiest and most unhealthy ponds, these fish appear to flourish best ; loving weeds more than clear water. There they can prey better, and can accommodate themselves to almost any hole ; getting "rich and fat," as other fish get lean and miserable. It is popularly supposed, that the tench and his analogue, are among the most useful of their classes.

The salmon (*Salmo salar*, Linn.) is termed "the king of river fish," from its beauty of form, size, and rich colouring ; the extent of its range, and wonderful power as a leaper. This fish ascends our rivers to spawn, not being stopped in its progress by weirs, waterfalls or rapids ; unless when very lofty. The salmon in its various stages, has often been taken for distinct species of fish, which vary greatly in value according to stage ; the young fish being worth much less, even by weight, than the full-sized salmon. These stages may represent the various degrees of value attached to different metals. The parrs may represent iron ; the smolts brass and the full-grown salmon silver. The destruction of the parrs is like that of the small capital of a nation or of an individual, which has not yet got beyond the value of copper coins ;—a value like the young salmon's, which if left to expand, produces a thousandfold in silver.

The salmon in its various stages, floats in our brain, an image of the commercial and national history of England. The nation like the ova of the salmon, was small at first but contained in itself the seeds of all its future greatness. The ova stage of the salmon, which has its beginning in the higher waters, is like the Saxon; the fry stage is like the Norman, which deeply agitated the western world of waters. The parr stage of the salmon lasts long, as did the age of the Plantagenets; for these princes like the parrs, sought the sea for conquest. The smolts are an intermediate stage, they are almost salmon; a fish good for the table, and from their advanced development may illustrate an intermediate period in history, such as that of the days of the Tudors. The grilse are young salmon, but still are very different from the full-grown fish. They may represent the age of the Stuarts, *who did not satisfy the people*; who longed for something better. At last they got the House of Hanover and our more fully developed Constitution; illustrated in the full-grown salmon, which are glorious fish.

They have been much lessened in numbers by folly and greed combined, in the mismanagement of rivers; which illustrates the encroachments on the royal prerogative. It is often said that a large factory on a river, though perhaps poisoning the stream, and killing all the fish, is better than a river full of "royal salmon." But our wiser men have lately thought that with proper care, we may have *both*. And now Imperial power wraps its mantle round the "royal fish."

The salmon trout (*Salmo trutta*) is the finest of the trouts and nearly approaches the salmon. Where it can, it visits the sea, but exists in lakes which have no connexion therewith, and can there propagate perfectly. It frequently reaches a size equalling that of an ordinary salmon.

Our chief nobility are like the salmon trout, equal in bulk and wealth to some of the "Royal salmon" of other nations. These succeed best when they can communicate with the sea. The minds of nobility expand by foreign travel; *yet sometimes fine and well flavoured "fish" are met with, which have not moved far from where they were "spawned."*

The common trout (*Salmo fario*, Linn.) is our most widely dispersed river fish, and a trout stream, is thought a great addition to the sporting value of the property of a country squire. Good fresh trout are fine in flavour, but vary much in taste as well as in size; soil and situation have doubtless much to do with this. We consider trout as a type of the older gentry, who are yet smaller, and less noble than the aristocracy. They are shy in habits, and do not like their privacy to be invaded; driving *parvenus* away, as trout do pike or carp, from their

favourite holes.—Thus squires will not have poaching on their properties. Sometimes these trout eat the ova of the more "noble *salmon*," in which they represent radical squires.

The grayling (*Thymallus vulgaris*, Cuv.) is a local fish, inhabiting principally mountain streams, with stony bottoms; in the most romantic and beautiful parts of England and Wales.—It is of a smaller size than the trouts. This choice fish has a peculiarly rich and aromatic flavour, when freshly caught. The angler sits on a bank where the "wild thyme grows," overhanging a clear stream, where with his lively fly, he entices the fish, which when drawn out of the water surpasses the sweet scent of the plant.

The inhabitants of our mountain districts still preserve much of the freshness and simplicity of a past age. Remove them to town and they disgust us, as this fish does when carried far from home;—it can only be enjoyed on the spot. Where many tourists go the natives become spoiled; and the fish become scarce. They cannot bear the muddy stream or brook, where manufacture grimly grinds its iron teeth; for it pollutes earth and poisons life with infernal smoke.

The pilchard, the herring of Cornwall (*Clupea pilchardus*, Block), is found on its coast throughout the year, but most abundantly in autumn. It appears in countless numbers, *twenty-five millions* have been taken on shore in one day at a single port.—A HERRING FOR EVERY INHABITANT OF ENGLAND, which like the pilchards, has sent forth shoals for the benefit of other lands. An enormous amount of money is spent in pursuing these fish, which produce more profit to those who buy them than to those who catch them.

The pilchards approach the coast like an invading army, but one whose presence is looked forward to with pleasure, as a deliverer from the pangs of hunger. This army is divided into three divisions when it appears on our south-western coast, of which the first is eastward of the Lizard, stretching to the bay of Bigbury in Devonshire (Yarrell), beyond which no fishing is carried on. A second position extends between the Lizard and Land's End, and a third is on the north coast of Cornwall, the head-quarters of which is about St. Ives. In the drift-net fishery, they start at sunset, and draw their nets in about two hours; which is rapid progress, compared with that of seine fishing.

In seine fishing the fish are surrounded, and several seines are shot and afterwards fastened together; great caution being used not to alarm the fish by noise. They are often kept alive a week in the seine, and dipped out by degrees with baskets, as they are wanted for use.

This invasion of pilchards reminds us of the "commercial invasions," by which we are put in possession of riches, not to be otherwise obtained. The catchers, like inventors or introducers of what is most useful to the public in general, do not gain the greatest profit. Those who fish in the sea of knowledge *with drift nets take a less amount of "fish;"* but are frequently better off than those, who by devoting all their energies to the more certain *seine-like* method of enclosure,—or inductive method in philosophy, may gain higher prizes; but may lose more largely. The "fishmongers" profit more than the fishers. Some clever manufacturers retail and apply the inventions of sublime minds, whom they would gladly cheat of the original bare credit of the invention, if they could; as they may have already done of the pecuniary benefit by some tricky patent.

The herring (*Clupea harengus*) is the species most numerously taken on our coasts, and more generally distributed than the pilchard, being found from the Orkneys to Yarmouth.

This great invading host, divides itself into two branches at the Shetland islands. The first division, visits almost every bay and creek on the western coast, while the second proceeds towards Yarmouth on the eastern coast, and is lost at length in the British Channel. The western branch visits the Hebrides first; where they divide again, one detachment passing through the Irish sea, carrying food to the inhabitants, while the other is lost in the Atlantic. But they are by no means perfectly regular in their appearance, and require not to be driven from their haunts by foul treatment.

The herring visits Greenland and Iceland rarely, but the coast of Holland abundantly. Amsterdam has been said to be "built on herring-bones," in allusion to the prosperity the port enjoys, in consequence of the profits on the fishery.

The herring is a true Teutonic fish, as those who pursue it are mostly Teutons. Celts are bad fishermen. It is not a little strange, that a species nearly allied, if not identical with our common herring, exists in the fresh-water lake Baikal, in Chinese Tartary. Typical of the Teutons who have been forced contrary to their inclination, to colonize that distant region. We can hardly fancy them at home there, yet they multiply and prove good settlers.

The sprat (*Clupea sprattus*, Linn.) is a little fish allied to the herring, of which our early naturalists considered it the young. From its great numbers it is of considerable value to the poorer classes, though inferior to the herrings. It is a coarse and rank fish to the taste, yet enjoyed by the grosser sections of the Teutons. They are cheap and wholesome, and far too good for manure, for which they are often sold. A sad waste of valuable

life ; contrary to the principle, that it is inexpedient for man, at the head of creation, to destroy a higher life for the mere sake of feeding a lower one. Although the fact of the absorption of the particles no longer required by the higher life, and that cannot be utilized by it, may in accordance with that perfect utilitarian system which pervades all life, nourish the meanest organism. When an Organism has once lost its *vitality*, it is the prey of living organisms ; or still lower, sinks into the Inorganic world.

"Imperial Caesar—dead and turned to clay,
Might stop a hole to keep the wind away."

These sprats among fish, have always been associated in our mind with "little sprats of children," who like them defile what they touch ; but yet fill the gaps in the lower population, made by the hungry mouth of death.

The white-bait (*Clupea alba*) is the sprat of the upper classes. Whiter, cleaner and more delicate, than that of the lower ; but will not bear carriage without losing its flavour. Even the children of the aristocracy, *lose their freshness* if removed from their favourite localities on the *muddy banks* where they sport, and carried into close rooms.

As might be expected the white-bait is more in vogue in London than elsewhere : particularly with Her Majesty's Ministers in July, when they have "*no other fish to fry*," and are glad to eat these on silver dishes, nicely browned with flour. And in accordance with what is now almost a proverb—DOZE OUT AN AFTERNOON UNDER THE INFLUENCE OF CLARET AND WHITE-BAIT ;—THE KNELL OF THE SESSION.

The anchovy (*Engraulis encrasicolus*, Flem.) the sprat of Italy, is popular amongst the upper and middle classes in England for its flavour, and is extensively made into sauces and condimental pastes. It is more as a *flavour* than as a *food* that it is used ; serving to spice our more tasteless viands. Most of our educated classes, like a foreign "flavouring" to their pleasures ; not being satisfied with what their own country affords ; while they are content to take their more bulky food of home growth. We have singers from Italy to flavour our Opera, as we have foreign artists to influence our historical school of design—mostly stale, who have lost the gorgeous colouring of radiant Italy. Andalusia furnishes its dancers, and Greece its literature and sculpture ; which are supposed to *lubricate* the pens of our writers, and the chisels of our artists.

The cod (*Morrhua vulgaris*, Cuv.) that good honest fish, that opens its mouth so wide, and bites so greedily ; makes itself the most generally useful of fishes ; the most wholesome,

nourishing and acceptable as food, of any fish of the sea. Its shoals visit the coast, from Portugal to Iceland, and from Iceland to 40° north latitude. It is commonly fished for all round our coast. Those engaged in its pursuit, salting and sale, number many thousands. It is universally taken by the hook, which is usually left six hours after being baited, before it is hauled up. It is one of the most prolific fish known, *nine millions of ova* have been taken out of one cod. It is the great fish of the banks of Newfoundland; and it is to this creature, that the Island owes its commercial importance.

The cod feeds on crabs and small fish. It is usually brought to London in "well boats," which admit the sea-water freely. The fish are fed in Scotland in artificial preserves, where they increase much in size. The cod is a stupid, gaping fish, with goggle eyes, which remind us of a certain class of Teutons who "swallow baits" easily, and when young are much picked up by "sea gulls," being not too "old" to be "gullible." These fish are the greatest feeders of both themselves and man, although they lose by it.

The cod eminently typifies the Teuton workmen in Celtic countries, who add so much to the comfort of the nations of Europe. These industrious Teutons, shift their ground like the cod, when the Spanish authorities or other illiberal governments, render their position unpleasant. The disappearance of the cod, on a coast where it was formerly abundant is a loss to the country, like that of the most thrifty and superior of the population. We have a memorable instance of this, in the case of the Protestant settlers, who were driven from France, at the time of the Revocation of the "Edict of Nantes," and settled as the cod has lately done, not far from London; and again not far from Norwich.

The Norway cod is a superior variety, it grows to a large size, is in great numbers, and is said to yield a fine oil, supposed to exert a healing influence, on those who need to have their blood purified and enriched. This is typical of the advantages which exist, in the "infusion" even at this date, of "Scandinavian blood" into the veins of many sickly families. But why go to Norway? Have we not cod on our own coasts? Yes,—although the better of some of theirs.—We possess the power of healing, many of our own social and physical diseases.

The haddock (*Morrhua aglefinus*, Cuv.) is a fish much in request, and abundantly does it accede to the demand, being found in the German Ocean, and on the Atlantic coasts of Europe. Their shoals are very dense, but capricious in appearance. They are hungry, greedy fish, consuming great quan-

tities of food. The haddock salts and keeps well. We see analogy in them to the Belgæ, who early peopled part of Europe, and also to the Celtic Scandinavians.

The pure Celts remind us of the whiting (*Morrhua lusca*, Flem.), rather a weaker, smaller kind of fish, which may be divided into two branches, the pouts and the silver whiting. The pouts like the British Celts, are the least elegant of the family. They are common in Cornwall, Ireland, Carnarvonshire and nearly all round the coast.

The flesh of the pout is excellent, but does not keep so well as cod or haddock; yet is not to be despised. The true whiting is the most delicate and does not offend the most fastidious palate. It is voracious, seizing everything within its grasp. Like the French Celts, who are so much more elegant than our own, but not the less greedy; they feed on the weaker of the Teutons, as the whiting does on the sprats and pilchards.

In the coal-fish (*Merlangus carbonarius*, Cuv.) of the northern sea, *enterprising* and prowling, we see a likeness to the hardy inhabitants of the Orkneys and Shetland, who visit the Arctic regions. In actual power in our population they are not great, but their energy gives them a respectable place.

The plaice (*Platessa vulgaris*, Flem.) with which we commence the flat fish, is a genus remarkable even amongst fish. The head is curiously adjusted to the spine, both eyes being on one side of the head. One eye is frequently smaller than the other. The mouth is peculiarly placed on one side, and the fins unequally on the two sides.

The more we examine these creatures, the more firmly do we become convinced of their perfect adaptation to their habits. The belly is perfectly white, and the colouring on the upper side, often resembles that of the rocks and soils they rest upon. If most of the species of flat fish, were of the same pure white on the back, as they are underneath, it would cause them to be observed and extirpated by their enemies.

Their flat bodies are typical of low life; what is *flat* in nature being generally of low origin. A flat country does not generally inspire elevating impressions; neither does a "flat face." And we do not admire the walk of a "flat-soled" individual, particularly if he has a "flat head," which is not often an elevated one; although "table land" does exist; both in geography and craniology. Inequalities in the face and brain are typified by these fish. If we see a man with one eye larger than the other, or one side of the head larger than the other; we argue "a *onesided character*," the individual showing "a double countenance" at different times. Such persons may be

great in size both in mind and body, but are not always to be depended upon in cases of emergency.

The plaice attains a large size, and is one of the most abundant of our flat fishes on all parts of the coast, and is highly valued as food, in common with all its genus. Where the sea is transparent they are speared in pretty deep water, by means of a short heavy weapon, to which a line is attached, and is then drawn up to the surface of the water.

These stupid fish, fall a prey to the *angler-fish*, as well as to those who use "the angle." They swim but slowly along the bottom, but if they rise to the top, they are often seized by fishes that swim much on the surface. Persons who look one way and speak another, are taken unawares. The plaice is a ground fish and is much eaten by the lower classes.

The flounder (*Platessa flossus*, Flem.) is the commonest of our flat fish, both in the sea and in rivers, at a considerable distance from their mouths. It is not unappropriately called "fleuke," as it is supposed to be the type of awkward movements, inexpressibly graceless, like that of floundering in the mud; a habit in the creature when the tide runs out at the mouth of the river. Like that "*tide of prosperity*," which has so long flowed on a successful though uninteresting merchant, who has done little to merit wealth, yet "swims in it." But at length the "tide of prosperity" runs out, and the merchant is left to his own resources. He is as helpless as the gasping fish on the mud.

A commercial brother more fortunate, swims in the returning tide, and sees his poor brother stripped by an accountant; as a carrion crow might pick the bones of a flounder on the mud of the Thames. Flounders are very dark in colour, and prefer the lowest parts of the mouths of rivers, to the surfaces of the limpid stream. Their antitypes amongst commercial men, have dark skins, and prefer the town to the country.

The dab (*Platessa limanda*, Flem.) is found on sandy coasts, and is distinguished from the flounder by the curve in the black line on its back. It has a very rough skin like a file: hence its Latin name *limanda*—a file. It is better in taste, than either plaice or flounder. It reminds us of the exclusively marine merchant; who is nicer in habits, but rougher than the flounder and his type. He is not so often stranded on the "muddy shore," but frequently on the Goodwin or other "yellow sands." There he is shipwrecked of life and property. The sea that supported him, recedes from him, and he meets there "a dry death."

The halibut (*Hippoglossus vulgaris*, Flem.) is the largest of the British flat fish, and is most common in the northern and Arctic seas. These fish are most abundant in "flat pieces of

water," between islands ; out of reach of strong currents and eddies. They yield a quantity of oil. The halibut feeds on its smaller brethren. Notwithstanding its large size, it is not very much valued, being coarse and hard in flesh.

In this fish we see an analogy, with the merchant of the north. He is coarse and rough in speech, but strong and large ; and if we can only be induced to tolerate him, he is exceedingly profitable to society, outweighing many others who are more generally prized. Such are the unfavourable specimens of the Scandinavian mercantile class. You cannot move them beyond a certain extent. Other persons will do more on an occasion ; but their regularity and steadiness, in the end triumph over their more meteoric southern kindred.

The turbot (*Rhombus maximus*, Cuv.) is considered the choicest of our flat fishes for the table, and reaches a very large size, being found on almost all parts of the coast ; but is more common in some places than others. From the Wash to the coast of Holland, is the portion of the sea where they are most abundant. The English do not succeed so well with fishing as the Dutch and the Scandinavian nations, who are more thoroughly at home on board ship even than we are.

The turbot fishery is very successful off the little island of Heligoland, from which the Dutch, who think they ought to be the masters of the island, reap a much larger profit by the mere sale of the turbot than the British Sovereigns of the land. The turbot is choice in its selection of food, wandering about the bottom of the sea in shoals for that purpose, and rejecting any bait in the least degree stale.

Our epicures admire this fish much, although they would not like the Roman emperor Domitian, summon Parliament to consult about the best mode of cooking it. Still a solemn *senatus consultum* of cooks, is thought necessary to deal with an extra large turbot for a London club dinner.

The turbot presents us with an illustration of the London merchant, feeding daintily, and turning up his nose at anything that is not of the choicest that the season affords. Foreign merchants and tradesmen, fatten by contributing to gratify his tastes. These Dutch turbots, represent a wealthy class of Hollanders and their descendants, settled in London ; who make money fast, and are very *solid* in their transactions. They make more than the old-fashioned English merchant, being more self-denying and orderly ; and like the turbot they are also *rounder* in shape. In after life they are very broad in the body especially towards the centre, which is also by far the widest part of the fish.

The brill (*Rhombus vulgaris*, Cuv.) is considered the flat fish

next in value to the turbot ; but by some it is placed lower than the sole. It is more rank and coarse than either. If turbot be put at the head of the table, the brill is placed at the foot—and may be compared with the junior partner of the merchant, who though he has an inferior place, yet gets a share of the lobster sauce ; showing how far he is indulged in his appetites. From having been originally in a lower station, he has perhaps, not even the degree of refinement and *delicacy* of the senior partner.

The sole (*Solea vulgaris*, Cuv.) to our taste has the finest flavour of any fish, and is one of the most favourite for the table. It is long and narrow in shape, compared with the turbot. It does not attain the size of the turbot or brill, and although a salt-water fish, will thrive in fresh water. They are sometimes brown on both sides, and the eyes and mouth usually on the right side, are sometimes found to be on the left side.

These flat fish appear to be most popular with the majority of persons. Flat uninteresting minds are the most common. The salmon the emblem of the precious metals, is worshipped as being the richest fish, the type of regal wealth and magnificence ; while commerce is adored in the turbot, and the high-flavoured notions of the age in the sole.—The *soul*—alike only in sound,—is forgotten. These long-shaped fish from their very length, are emblematic of the long-drawn, spun-out characters of men ; by which vastly greater length than breadth is attained, and when depth comes to be considered, we see how “shallow” they are ; like their emblems the flat fish, in spite of their fine flavour.

The remora (*Echeneis remora*), the most curious of the sucking fish, by means of its flattened disk, near the head, exhausts the air between it, and any object it may wish to adhere to, living or dead. The Mediterranean species here referred to, was well known to the Greeks and Romans. The fish is slow in motion, and cannot go at a rapid rate through the water, unless attached to some more swiftly moving object, which may afford it food by the parasitic animals adhering thereto. Showing that fishes have parasites of their own class, as well as of lower classes, who preying on their crustacean and molluscan parasites, rid them of many pests of a noxious character.

The habits of this fish, suggest a means by which the bottoms of ships can be approached, when they are under the water ; and point out where improvements should be made in the diving bells at present in use. A diving bell used for the purpose of ascertaining the state of a ship's bottom, must not be independent of the ship, on account of the eddies, which

counteract the natural attraction of small, to large bodies. Alternate attraction and repulsion, without the introduction of some stronger force, would provoke concussion, between a loose diving bell and the ship.

Eels (*Anguilla acutirostris*, Yarrell) have an external resemblance to snakes, but are as true fish as any. They breathe slowly, and can remain a long time under water,—even months in the mud, during the winter season. They are very rich but rather strongly flavoured, and only find favour with those who have not delicate stomachs. The Dutch deal much in eels, which are very abundant in the canals and ditches of their country. They are tamed in the Polynesian islands, where they attain a large size, eating freely out of the hands of those they are accustomed to.

Eels are impatient of cold, and do not exist in the arctic regions. In our climate they are speared, during cold weather as they lie buried in the mud of rivers or ditches. To remain in this state so long, indicates the *lowest condition of respiration*. Throughout the animal kingdom this is accompanied with a low degree of irritability, both of nerve and muscular action; and contrary to what is remarked, that long and lean animals commonly exceed stouter ones in activity. Had eels large fins, and did they move in a straight line, they would doubtless be among the most active fishes: but their serpentine course lengthens their route through the water, and is the means of explaining much in their history.—AN INDIRECT COURSE IS USUALLY THE LONGEST.

These long-lived eels, so low and earthy in habits, like snakes and other animals of languid circulation, possess an extraordinary tenacity of life, in which they typify the reptile class among moral beings, "whose lives have been prolonged for a season and a time;" while others more elevated in character and habits, live but a short day, to rise to a future life of happiness. The eel's richness is typical of the wealth, which those who live long, worship. These fishy worms and their types, often enjoy their pleasures long.

The great pipe fish (*Syngnathus acus*, Linn.) belongs to a singular tribe, possessing a very elongated beak, which has a curious valve-like jaw at the extremity. The female sheds her spawn into a sort of pouch under the belly of the male, in which they are hatched, according to Mr. Walcot's account, quoted by Mr. Yarrell in his "British Fishes," and confirmed by four foreign naturalists. The male alone has the pouch into which it receives the young fish when danger approaches.

The great length of their tube resembles the woodcock's beak amongst birds, as their body does the shape of a reptile;

and they approach the Marsupials among quadrupeds, in having a pouch for the reception of the young.

In a creature which presents analogy with so many branches of the animal kingdom, we see what reminds us of varied forms of spiritual influences, at once earthly, aerial and marine, which this creature's structure, instincts and habits illustrate, though to a feeble extent. Its shape resembles the usual descriptions of the great sea serpent. The sea serpent typifies the "Dragon that is in the Sea," being indistinctly seen, and has never been captured and perhaps never can be, by human hands.

CHAPTER VII.

TEACHINGS THROUGH THE STUDY OF REPTILES.

TORTOISES — ALLIGATOR—TORTOISE — CROCODILE — ALLIGATOR—CHAMELEON—
 MONITOR — AMBLYRHYNCHUS — IGUANA — BLIND-WORM — SNAKE — PYTHON
 — BOA — COBRA — VIPER — RATTLE-SNAKE — SEA-SNAKE — FROGS — TOAD —
 PIPA — NEWTS — SALAMANDERS — PROTEUS — LEPIDOSIREN.

A HORROR of and shrinking from reptiles, appears to be deeply impressed on the mind of man. It probably commenced at an early period, with his "temptation and fall." In all ages and in most countries, reptiles have been objects of adoration by those who worship power for its own sake, and that often in proportion to the mischief committed by its abuse.

Tortoises have been in all ages a type of slow progression, but their progress is of a steady character. Gifted with little intelligence, they are yet pertinacious in their pursuits, and thus accomplish greater things than some animals whose circulation is more rapid. Their shield of hard plates, renders them safe from the attacks of most animals, but some of the eagle tribe have been known to lift them in their talons, and carrying them to a great height, let them fall so as to break the shell, and then feast on their softer parts.

In the harmless tortoise, we see an analogy to the quiet and inoffensive amongst ourselves, who are guiltless of bloodshed, and are willing to work hard for the sake of accomplishing what is necessary, even if that be a slow process. It is said of the tortoise that previous to hybernation, it slowly excavates a chamber in the earth for itself, but proceeds more rapidly in proportion to the coldness of the weather, until the work is finally accomplished. In like manner our slow men, are often unwilling to exert themselves except when obliged; but can do a good deal, and often provide a comfortable home for "the winter of life." During the summer the tortoises breed, bury their eggs, and leave them without further thought. Some very lymphatic men are comparatively indifferent about their offspring.

The great tortoise (*Testudo indicus*) of the Galapagos Archipelago, is one of the largest of its tribe. Unlike some other species it drinks large quantities of water, and forms paths down to the drinking places, by following which the Spaniards often discover water. These tortoises are said to move at the rate of eight miles in two or three days—a good distance considering how slowly they travel: proving what can be done by constant motion, even of the most leisurely kind.

When caught by the natives, the animal is slit near the tail with a knife; and if fat killed outright for food; but if lean is liberated that it may become so.

The natives of these islands are suitable in character and civilization with the fauna,—one of the most curious on the globe. The inhabitants are degraded, having been mostly convicted of crimes, and banished from the main land. The islands are as unproductive of great events as of great plants. The large animals are reptiles; and in like manner the energy of the population is of a debased character.

The alligator-tortoise (*Chelydra serpentina*) is the fiercest of its kind, snapping up fish, young water-fowl, and even venturing to attack man by biting off his fingers when he comes in its way. It is common to Canada and the United States, and shows a considerable likeness to the skulking Indian tribes, who do not hesitate to attack, when they fall in with those worth plundering. They combine the cruel treachery of the snake or lizard, with the impenetrability of the tortoise.

The alligator-tortoise has powerful prehensile claws, with which it lays hold, while it bites furiously with its toothless mouth. Its eye and upper jaw, resemble those of a ferocious hawk:—it has not a spark of gentleness.

These shielded reptiles are typical of modern engines of war by sea and land. In the "Monitors" and "Cupola ships," we see the turtles illustrated, which has been formerly remarked by other writers, and in the tortoises we see a resemblance to the shore batteries and land defences. The Romans even, used plated shields suggested by this creature, in their attacks on fortifications; they were called *Testudo* (see Livy, b. x. c. 43). The plates are capable of resisting an immense amount of pressure, and on a reptile's back are typical of the degraded condition of society which renders these means of defence necessary. Yet the tortoise is not a type of *degradation* so great as is the snake or the lizard, which typify demoniacal influences. The shield reptiles may illustrate corrupted man; but the alligator-tortoise, illustrates him possessed by a demon.

Shield reptiles become very fat, and afford sustenance to many persons. This may be emblematic of the commercial

prosperity, and high state of living which often accompany preparations for war. It has been justly argued that these means of defence are necessary for the protection of the wealth that lies beneath the shield, which would without a strong defence,—like the fat of the reptile, be exposed to plunder.

The crocodile is the chief of the lizards, their king and emperor, and well does he represent Beelzebub, typified by “the Leviathan” of Scripture. This creature has more boldness than any of the lizards, and is effectually protected against attacks; being impenetrable to most weapons on the back and tail. Its teeth overlap each other; and when the mouth is suddenly shut they sometimes enter the opposite jaw with such force as to become embedded, so that its mouth cannot be opened without an iron lever. It seizes animals of moderate size, and dragging them under water drowns them, bringing them on shore to be devoured.

The crocodile's eggs are small, and in this state, or while very young it is easily killed. When of a large size it is very formidable, and possesses enormous strength; its daring and courage being also excessive.—Its voice is a hollow sepulchral growl.

Nations who are most in darkness and under Satanic influence, are the most cruel and savage. These have the largest lizards among them, such as the natives of tropical Africa. According to Dr. Livingstone the Bakwains of South Africa, have a horror of this animal. “When they see it they spit on the ground and say, ‘*there is sin.*’” Alligators are found in most parts of tropical America, the Indian Archipelago, and other regions, where morality and religion are at the lowest ebb. The most important lizard is the *Crocodylus vulgaris* of the Nile. In some districts of Egypt according to Strabo they used to worship this great lizard, which was fed and treated with every honour. According to Champollion it was called *Souchis*, the Egyptian name for Saturn.

It may be as well to mention here, the probable analogy between the reign of this god Saturn and Satan, which preceded that of Jove or Jehovah, by whom he was rendered incapable of reigning; while Jove took his place. This was perhaps founded on the tradition of Satan inhabiting the earth, from which he was driven by superior power.

The crocodile's aspect is terrible, not by any means charming. He represents Satan triumphant but enraged, not as a seducer, but as a destroyer: for this great lizard is an enemy to most animals. But the little spur-winged plover (*Holopterus spinosus*) called by the Dongolians “*El-Um-Tisaad*, the crocodile's niece,” is allowed to perch on its back, and even

enter its mouth to extract leeches, or particles of food which cling to this dragon. This bird is a type of those who for the sake of "filthy lucre," become servants of the evil one. "All working together for good" in the scheme of universal government. Thus the spur-winged plover, although the friend of that *enemy* of man and other animals, the crocodile, yet contributes to maintain "the balance in nature."

The alligators of America are found throughout its central regions and the West India islands. Yet in the British West Indies they are generally less numerous and formidable. The state of morality in the latter islands is low surely, but does not reach that mingled condition of idolatry, superstition and licentiousness, that characterize Brazil, Columbia and Central America.

Don Ulloa in his "Voyage to South America," says of the alligator, that "it lays in the space of two or three days, 100 eggs, which it covers with sand, watching the process of hatching from some little distance. It is more than ordinarily furious when any animal approaches the resting-place of the eggs. When the young alligators escape from the shell, they crawl on the mother's back, and are thus conveyed to the water. The turkey buzzards or gallinazos (*Cathartes aura*) devour many of the young alligators, and the *anxious mother* herself eats all the weaker ones."

Such alligators are typical of the Republics of South America. The metaphorical "leviathan" in order to crush man more effectually, reduces him to a low level—a Democracy, that he may the more certainly force him beneath the wheel of the "iron car of war." An intestine form of strife is that most favourable to the utter demoralization and degradation of a country. When the bowels are diseased in the physical man, digestion cannot go on, for they are too much "at war" among themselves to attend to the maintenance of their resources. They require the aid of an extraneous surgeon, if it be not too late. These republics are in a similar state of disorder, which calls for foreign aid to give a chance of a cure.

Crocodiles have little love for their own offspring, unless strong and vigorous, but make them their prey if they show any signs of weakness. Are alligators, so renowned for strength, unwilling to be represented by *feeble* descendants who might not be equal to their numerous enemies? Or does it establish the inconceivable brutality and cruelty of the mother, who devours her own brood, as freely as any other prey?

The chameleon of which there are several species, illustrates forcibly the theory of "The Double Organization," in many branches of the human and animal organism. The chameleon

appears to be an anomalous reptile, one half of its body being more independent of the other half, than is the case with any other creature. One side looks, breathes, is coloured, awakes, while the other is asleep or of a different colour. The eyes are capable of squinting, or of independent motion to an extraordinary extent. In like manner we see how human beings may be paralyzed on one side, and how one hemisphere of the brain may be diseased, and yet the other half of the system may retain its functions to a considerable extent.

In the chameleon we see the many-coloured reptile form, accommodating itself to light and darkness. Assuming the azure of Heaven, the red-brown of Earth, or the neutral tints of Flesh, between the two; and yet so cold withal, that we shrink from its touch.

The chameleon is the type of a journal, taking its *tone* in politics according to "the times," and assuming a "*colouring*" at will, in proportion to the *clearness of the atmosphere*, or the influence of *reflected or transmitted light*. It is "reflected" when it falls in with popular opinion; it is "transmitted" when it becomes a "government organ."

The chameleon is said to have the paw of a parrot. It has a *long tongue* like most "*gobemouches*," and a goggle eye in proportion;—a type of an incessant prattler, who believes what he hears, and who picks up the smallest atoms that fly past him. The prehensile power of the chameleon is great, like the grasp of modern journalism.

The Nilotic monitor (*Monitor niloticus*) is one of the largest of the recent Saurians, and is very tenacious of life, and according to the Arabs destroys many of the eggs of the crocodile. They are amphibious and are said to give warning of the approach of the crocodile, by hissing or whistling. The Nilotic monitors may be compared with the magicians of Egypt, who professed to use their powers for producing or removing calamities. Magicians frequently accompany their spells with noises, resembling those made by reptiles. The familiar spirits, spoke "out of the dust" (Is. xxix. 4) that is to say from a low position, as it were out of the ground, like reptiles.

The dragons of which so much has been said by early writers, were not probably creatures of the imagination, but had their descriptions founded on the remains of extinct Saurians, such as the Pterodactyle.

The present little flying dragon (*Draco volans*) is a small harmless creature, found in the Eastern Archipelago. It lives in trees where it flits from bough to bough like a flying squirrel. Such an animal is trivial when we consider what was for-

merly said of those creatures, and has caused some of us to look on those with pity who fear "the dragon." Formerly he was viewed as an inconceivably awful being of enormous power, but now the "progress of knowledge" has shown him to be a mere harmless lizard, a *jest* compared with the powerful creature he was once supposed to be.

This state of modern feeling is unfortunate in a moral point of view, leading some to trifle with one, who although unseen at present is not the less a reality. The Pterodactyle, a gigantic winged lizard of past ages, is a type of what Satan's power once was, and what it may be again.

The lizards are small compared with the crocodile, but still, some do attain a great size. Those in Great Britain and the Protestant countries of the north of Europe, are few and small; while as we approach the south they become more numerous, attaining their maximum of European development on the shores of the Mediterranean.

Bruce relates that he saw thousands of lizards in one day, in the court of the great temple of the sun at Baalbec, covering the ground and walls of the ruined buildings. Their colour was dazzling to behold as they glittered in the sunbeams. They are suitable types of the ruin and desolate state of what was once magnificent, grand and the wonder of the whole district; but now the abode of lizards, bats and owls!

The *Amblyrhynchus cristatus* of the Galapagos Archipelago is a lead-coloured animal, slow in movement, unintelligent, and hideous in aspect. It has little fear of man; but is harmless and not inclined to bite. Its food is seaweed, which it seeks at the bottom of the sea. It runs freely towards those who injure it, in which it shows extraordinary folly and stupidity. The human inhabitants of these islands are stupid and degraded, and show little desire to lean on a Higher Power who would benefit them; but lean towards vices which are their enemies. Their sustenance is as wretched as their lives. They have little activity, being torpid and reptile like in their habits.

The iguana (*Iguana tuberculata*) of the West Indies is one of the largest of the lizards. It is not formidable, and is eaten as a choice article of food, particularly in the Bahama islands, the inhabitants of which live so much on the spoils of smuggling. —They haunt as these lizards do the remote "Keys" or little islands in their sloops, to be followed by the "Dogs of War," which catch them as the hounds do the iguana.

The lizards of Britain are small and insignificant, and only destroy flies and insects. They typify the influence of the "Evil one" in this country, which is less in our highly favoured land than in some others. Ireland seems to be an exception in having

no lizards; yet in that country the favourite domestic animal is the pig, which is significant of a lower standard of agriculture as of morals, than that prevailing in some other parts of Europe.

The blind-worm (*Anguis fragilis*), is a very quiet inoffensive little creature making no noise, and feeding on earth worms and slugs. Did it not belong to the reptile class, it would meet with more favour; but being so low in its habits, and incapable of raising itself from the ground, it escapes the observation of many. It may typify that degraded race the Gypsies, who appear almost out of place in our land, where they have little influence.

The serpent tribe (*Ophidiæ*) are the great seducers of the animal world, and they only attack what is living. Their structure is of a very simple character; they may be roughly divided into two classes; those that *bite* and those that *crush*. The jaws of serpents are wonderfully elastic, and their bodies are highly flexible and capable of great distension. Their spots illustrate their varied character, and are common to the greater number of species. Almost all the serpent tribe in temperate climates hybernate, and a large number are torpid in the dry season in tropical countries.

As they live to a great age in common with others of the reptile tribe, they are aptly typical of "the Old Serpent." This long lease of life, is one reason why they are said to be "*wise*," as "old age,"—if the faculties are retained, gives immense advantages. Old men and animals are much more difficult to catch than young ones.

The different methods pursued by serpents for conquering their prey, illustrate those pursued by Satan. He is smooth and slippery, like the serpent tribe until his grasp is sure, when he displays his relentless character. He acts in two ways, one by *poisoning the blood* of those who fall in his power, corrupting all their *flesh*; the other by crushing their spirits and rendering them without hope, so that he can devour them at leisure. The mouth of serpents reminds one "of the jaws of death." Some are sucked down unconsciously as it were; while others in writhing agony of mind and body,—PASS AWAY.

The common snake (*Tropidonotus natrix*) is a species found in these islands. It is only dangerous to creatures like frogs mice and lizards. They lay their eggs in hotbeds amongst decaying vegetation, where the heat engendered by the putrefying manure is great. Such is representative of the cause of the increase of reptile-like men, who are thus *forced* into greater prominence and increased in number.—Disorganization in society greatly fosters evil influences.

In the present state of the world decomposition must go on;

but after a while these creatures which so much flourish in ruin and decay, will confine themselves to the attack of what is utterly worthless and injurious to society, becoming the special instruments of USE, although in a low place. Scripture makes this clear to us. Serpents appear to have been from the first a symbol of debasement, illustrated by their *low flat foreheads*, which are emblematic of their lives. This is taken up in Genesis, in illustration of the *future degradation* of Satan, whose head was to be bruised; and in harmony with this the serpent tribe is in the holy mountain, to feel a CHARMING influence;—not to be DEAF as the adder formerly was.

The python is one of the largest of the Ophidians. They are not venomous, but are very destructive to smaller animals. Perhaps a graceful antelope comes to drink at a stream in the province of Natal. It is near the water; when it suddenly hears the hiss of a large python, and sees its fierce eyes glaring upon it. The antelope begins to palpitate from fear. It might cross the river and be out of the reach of the serpent in a moment; but while it gazes trembling at its enemy, a coil is thrown round it, followed by several more. In vain the creature writhes, darts out its tongue, bleeds at the nose and mouth, and implores the earth that drinketh in its blood. Its breath is gone in those last sighs. Then its great enemy having broken its bones to short lengths, with his tongue anoints its head, and sucks the whole body down his widening jaws.

In like manner those who trifle with evil, if they have not greater force themselves to resist its serpent-like fascinations, should fly without a moment's pause. But many struck by its aspect, wonderful and terrible, stand in mingled fear and admiration and so become like the fascinated animal,—a prey.

The pythons incubate, laying eighty or ninety eggs on which they sit, and take no food during this period. All that approach them are greeted with a horrid hiss from the mother of the pythons. Just so Satan hatches his evil instruments, protecting them with care until they are ready to "play their parts" and seek their own prey. The Incubation of the Python illustrates the growth of Evil, which is not yet fully mature. The Incubation of the Dove is similarly illustrative of the Dawn of Purity on Earth. According to the Koran, the snow-white doves yet nestle in the Throne of Allah.

Boa constrictors of which four or five species are known, inhabit tropical America, dwelling in swamps over which they rule as emperors among wild animals. The highest trees are climbed by them with ease. They swim like eels in the water and move on the ground with all the celerity of a jaguar.

To a creature of such varied powers the Mexicans gave divine

honours, illustrating the tendency which corrupted man has, to worship what inspires him with the greatest terror. The Mexicans ornamented a figure of one of these serpents with rings of gold, which they placed in their *Teocallis* or temples.

The boa is the most powerful of American reptiles, and when it attains its full size as it does in the tropical regions, no animal can withstand it. This is typical of the gross idolatry into which the southern central Americans were plunged.

Other countries have more numerous animals of prey to divide with the serpents their rule. In this central region, semi-civilized paganism attained its utmost development on the American continent; crushed the miserable population in the coils of superstition; squeezed out *every breath of truth*, and reduced the mass to a state of unconsciousness of what was passing in the rest of the world.

The *Cobra di Capello* or Naja admired as the spectacle snake, but dreaded as one of the most deadly of a venomous class of reptiles, in most cases causes the death of those it bites in a few hours. These creatures are found in Egypt and Hindostan, although distinct species, in harmony with which these countries have been famous for serpent worship, as well as an abject spirit and low Morals. A class of persons exist in these countries, who possess the power of influencing, and to a certain extent taming these animals by words or music. This power is usually called "supernatural," and may be Satanic or Mesmeric. It is probably sometimes one, and sometimes the other; for mankind always have had an idea, that the influence of Satan is exerted in favour of those who become his slaves.

In the action of the poison of these deadly serpents, we see much that is instructive. The speech is first affected, then the respiration; the sight becomes dim, the pulse becomes fainter and fainter, and the extremities cold; death stealing on without that convulsive struggle, which so usually precedes man's exit from this world.

Our parents when bitten by the "Old Serpent," had their *blood poisoned*, which was death to them and their posterity. The "poisoned blood" circulating through their system, has had a corrupting influence throughout. The Deluge in the days of Noah did not heal the disease. The confusion of tongues was another effect of it. This poison is fatal, and can only be met by the introduction of a greater force. "One fire burns out another's burning." A new flame of life flying through the circulating system, separates the poisoned life, which decays; but leaves a cast of a being, in which its former qualities are seen, but yet far higher in tone and purer than they were, before the POISONED BITE.

The viper (*Pelias berus*) is the only venomous snake known in Britain, and those bitten by it do not die so commonly, as by the poisonous serpents of other and hotter lands. The viper varies so much, that it is not quite clear whether there may not be several species included under its name. Its food consists of small mice, young birds and reptiles. It usually brings forth its young alive, from eggs hatched within the body of the mother. When born they show great ferocity, attempting to bite before their fangs are developed, proving them to have even at the earliest stage, the tendencies of their mother the old viper.

Venomous serpents in general are a type of corrupt religious systems, which oppress many lands; but from which even Britain is not entirely free. The depth of iniquity existing in tropical Africa and in Central America, is illustrated by the deadly serpents that inhabit these regions: and the vices of certain of our religious systems, are typified by the British viper which is most to be dreaded by women and children. These have not however always that wholesome horror of *human vipers*, that renders them comparatively harmless; for the viper is most *deadly* when "fostered in the bosom."

The old viper represents paganism; the young vipers its imitations sprung from the same stock. The grandmother of the vipers is "The Old Serpent."

The viper is sometimes oviparous and sometimes *viviparous*; that is to say sometimes born *alive*, and sometimes *hatched* from eggs. Those born alive illustrate acknowledged children, and those hatched from eggs, such as are secretly affiliated to her. As the vipers have different degrees of venom; so the various orders of priests vary in their power of injuring those they dislike; this is partly dependent like the viper's poison, on LOCALITY as well as on SEASON.

Vipers have their homes in places where putrescent matter accumulates. Not that they live on it; for they hunt only for "the precious life," being willing to attack those unsuited for their food, and only want the power to compass their death.

The celebrated rattle-snake (*Crotalidæ horridus*) of North America is fortunately gifted with a noisy rattle, as a warning of its approach to men and animals. The horny rings of the tail alternately expanded and contracted from each other, occasion this clattering sound. This serpent is generally indisposed to attack man or large animals, but its bite is among the most venomous. In summer it is most inclined to attack, while in winter it is torpid or nearly so. A number are frequently found together in a pit lying helplessly coiled round one another; in this state a child can destroy them.

The rattle-snake is said to exercise a fascinating power over squirrels and other small animals, which could easily escape were they inclined. "A way of escape is made" for most men, but the influence of "The Serpent" pins many to earth, which they are unwilling to leave. The wise and enlightened accept the warning sound of the approach of the destroyer, and get out of his way; but those who trifle with him, unless armed with the power to vanquish him,—suffer.

It is advisable that serpents should not be extirpated, as they keep us in mind of the existence of evil agencies; and put us on our guard against them, encouraging and exercising our various powers therein.

The black snake (*Coryphodon constrictor*) of the United States is a formidable reptile, difficult to extirpate. There are black snakes in many countries, as in Australia and the Cape of Good Hope, which illustrate their dark, depraved human populations. That of America does also the Negro, "the great difficulty" in that land.

All serpents cast their skins. For some time they are drowsy, reject food and appear very dull in colour;—the bright shining lustre of their scales is gone. At last they become quite blind, and crawling amongst thorns and brushwood; by their contortions they manage to crack their skin all round the middle, drag themselves through the sharpest thorns head foremost, pull back the skin over their heads like a reversed glove and slip out of the skin at the tail. The skin of the eye likewise comes off. The serpent appears fresh and in tenfold beauty to what it was before; and is then ready to start in search of prey.

At present Satan is preparing to assume a new appearance; when the time has arrived he will apparently possess more power than ever, and will be adorned with a brilliancy which he probably has not had since his fall. The serpent's change just described, is clearly a type of the *undying* transformations of evil spirits. It is not a passage to a higher life like the metamorphoses of Insects.

Snakes may be charmed, their fangs taken away, and thus rendered harmless—a type of man over whom Satan reigns no longer.

The sea-snakes (*Hydræ*) infest the Molucca islands and are much dreaded by the fishermen, who consider their bite certain death. They often catch them in their nets, and when taken out of the water they speedily die. They have broad flat tails, which act as a sculling oar, to propel them at a rapid rate through the water. At present they are the only representatives of "the Great Sea Serpent" which have been examined by man, for it has not fully come into view.

The Amphibia is the last great order of reptiles, and varies in form and habits from the Cæcilia, which burrow like worms through the mud, and swim with facility in the water like eels, —to the frogs and salamanders. These Cæcilia somewhat resemble blind-worms in shape, and are found in South America, Ceylon and India.

The spawn of the Bactrians or frog genus resembles that of fishes or the eggs of Mollusca, and is somewhat like jelly. When hatched they assume a form like the early stage of a fish, and at first have tufts or Branchiæ on each side of the neck. These separate oxygen from the air, which is held in solution in the water they inhabit. Small supports enable the tadpole, which has hardly yet assumed this shape, to cling to stones and plants, for even its lips are not as yet developed. Gradually the Branchiæ disappear, and are replaced by gills like those of fishes. Hind legs at last make their appearance, but the creature is still a tadpole. It is ravenous, and grows rapidly; then four legs appear; and as the lungs are gradually developed the gills disappear, and at last the tail shrinks and is lost. The frog now leaps among the herbage, a small but perfect animal.

There is analogy between the progressive development of each class of animals towards maturity, and the history of the extension and growth of powers and forces in the Moral world.

The frog's spawn, and young tadpoles are much eaten by the newt, the near ally of the perfect frog. This is typical of the embryo nation, which is cast like the spawn of a great frog, to be exposed to be devoured by powerful enemies. Nations in their juvenile state of helplessness, are often "attacked by those who from their similar habits, might be expected to pity them." The next is the fishy stage, the first of motion, like the nation's earliest child-life. The mouth of the frog is not yet developed, like the language of the nation which has not copiousness.

The frog continues to grow until it fully enters the tadpole state. The head is large, and commands every part. In this state where the head is the most prominent feature in the animal, we see an analogy with the Celtic Gauls, who were more inclined to centralized power than the other tribes inhabiting France. The tadpole acquires feet as its head becomes smaller, which is analogous to the period of French history when the Franks got a footing in the country. Less was then dependent on the head of the government than in the days of the Gauls.

The *tail of the frog* shrinks in and is lost, but still we see where it was; which is analogous with the indistinct remains of the early history of the nation, and its traditions, which like the tails of animals *point back*. It was not until these traditions

were greatly forgotten, that France reached the summit of her glory. The French frog was perfect two centuries ago, but it was not full grown until the days of Napoleon first, when it swelled and puffed greatly beyond its natural limits. The head was in France; a fore leg in Germany and Russia; one was in the Peninsula; a hind leg was in Italy and Egypt, and another reached to the north of Africa. But when it swelled in defiance of "John Bull,"—*rana rupta*.

There are three common species of frog in Europe, of which our vulgar frog (*R. temporaria*) is the best known to us. But the green or edible frog (*R. esculenta*) is the largest species. It is a voracious animal, seizing and devouring young birds, mice and insects. It is common in France but rare in Britain. The third is the fire-frog (*Bombignata igneus*) which does not exist in England. It attacks the small fish which swim in the European ponds.

We consider those different species of frogs, illustrative of the French character at various stages of their history.

The French are vulgarly supposed by the English, to be somewhat *long-faced* and *lantern-jawed*, ill set in the legs, but active and excellent "at hopping;" lively and sportive. These are some of the qualities and personal characteristics of our common frog.

The second or edible frog, may illustrate the French as possessed by "utilitarian views," which are so much cultivated at present, but which like this voracious frog may destroy what is of more value.

All the frogs are remarkably glossy and polished, and the French nation is fond of what is brilliant and highly varnished. FRENCH POLISH IS A TRUISM.

The fire-frog reputed venomous, may represent the flashy, "fire-eating," bloodthirsty propensities of the nation, which cause so many of the smaller states of Europe to tremble.

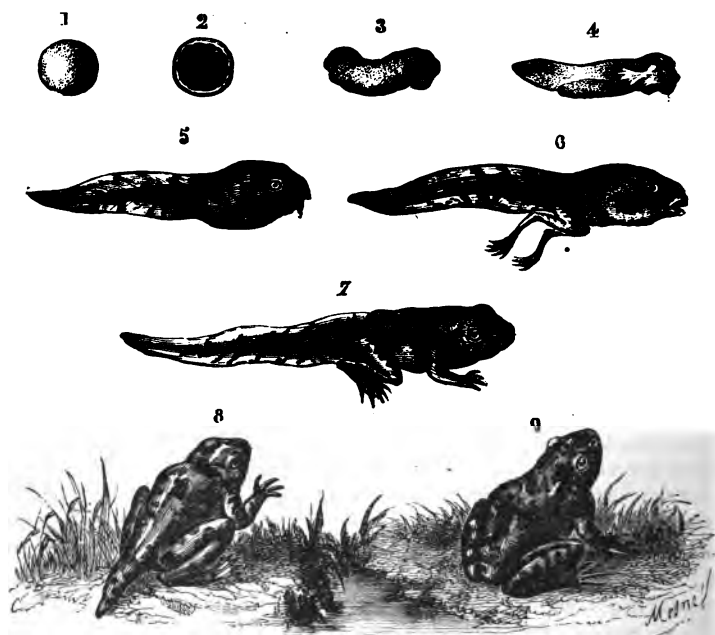
Lastly writers on prophecy like Mr. Elliott in his "*Horæ Apocalypticae*," tell us that there were at one time three frogs on the shield of the arms of France, which he thinks has reference to the "three unclean spirits *like frogs*" mentioned in Revelation xvi. 13, which "Came out of the mouth of the Dragon, out of the mouth of the Beast and out of the mouth of the False Prophet."

The bull-frog (*Rana mugiens*, Catesby) is one of the largest of its kind and has a harsh bovine voice, which to the ignorant sounds as terrible as that of a bull. It is common in the United States where it is heard at most seasons, but its bravery is less than its "brass;" it is however difficult to keep within due limits. It is carnivorous, devouring fish, mollusca and

young ducks, which latter in England are stronger than the frogs.

In America, frogs are less famous for their Sportive than for their Grasping qualities, which they carry to a greater extent than do the French frogs. They may illustrate the more noisy traits of Yankee character, which so often bring the nation into disrepute.

The tree-frog of Europe (*Hyla arborea*) belongs to quite a distinct genus, approaching the geckos and chameleons. They



DEVELOPMENT OF THE FROG.

1, Spawn. 2, Spawn fecundated. 3, First stage of the tadpole. 4, Tadpole showing branchiæ. 5, The perfect tadpole. 6, First appearance of the feet. 7, The appearance of four feet and suppression of branchiæ. 8, Frog retaining the tail. 9, The perfect frog.

are beautiful creatures, remarkable for their agile movements among the leaves and shrubs. Their structure permits them to walk with ease on the under side of leaves, and to spring on their prey with extraordinary rapidity; which consists of flies and little insects alighting on the leaves.

The farther we proceed south in Europe, as a general rule, the smaller and lighter is the population physically, and the more given to pleasure. We refer to the Celts and Semi-Celts in Germany, France and Italy.

The common toad (*Bufo vulgaris*) has been much reviled as a poisonous creature, and certainly the moisture exuding from the glands in its back and sides, is a somewhat corrosive liquid, poisonous to animals and not wholesome to man. They are humble and generally inoffensive reptiles, which crawl along at a slow rate and pick up slugs and other injurious creatures in our gardens.

Those men who flatter others in an obsequious manner are called "toadies," from the analogy they show with the habit the toad has of licking the slime of the slug. Human "Toadies" frequently possess disagreeable or injurious qualities, which do not however injure the more noble specimens of humanity.—The toad is only dangerous to the smaller and inferior animals.

The pipa (*Bufo pipa*) of Surinam is an awkward, grotesque animal; far exceeding our common toad in size and ugly uncouthness. It is one of the most wonderful of known animals. It is now well ascertained that the female spawn is spread by the male on her back, and is received there into little cells, in which the transformations take place; when the young escape as small but perfect toads.

The Carib aborigines of South America, refuse to share with the female, the labour of providing for the young, giving themselves over to hunting and war. On the back of the mother is thus put the burden, which some even of the lower classes of animals, do not devolve entirely on her.

The newts or tritons are abundant in stagnant pools, over which they rule with tyrannical ferocity, driving before them the small water insects and sticklebacks. They are mostly confined to stagnant water or slowly running streams, where the decomposing vegetable matter, attracts numbers of aquatic insects and mollusca. The tadpoles of the frogs form a considerable portion of their food. Their transformations resemble those of frogs. The males during the breeding season, acquire a crest and more brilliant colours. In their ferocity and ill temper they equal the crocodile.

This creature is a type of the destroying influence of demons, which are less dreaded in these northern countries than in the south; but they nevertheless exist, and only want an opportunity to display their powers.

The salamander (*Salamandra maculosa*) has been for ages the subject of incorrect observation and superstition. This animal was said to be capable of resisting fire, which is to a certain extent true, for it has been known to rush into a fire-place, remain for a few seconds in the hottest part, and come out alive and uninjured. It is provided with numerous glands, which secrete a liquid of a saline character, a bad conductor

of heat, which acting like a solution of borax or alum, preserves its skin from the rapid influence of the fire. This with the cold-blooded nature of the creature, enables it for a few seconds to resist an active flame, which would immediately destroy the life of a small mammal, bird or insect.

It is a little animal, black with yellow spots of a longitudinal shape; which significant colours, those of light and darkness, doubtless assisted in fostering the prejudices with which it was regarded. These were partly founded on fact, for its skin is highly poisonous, and small animals cannot eat it without injury or death, or even with impunity what is defiled with its secretion. The salamander is a true reptile and is typical of light and darkness. It thus represents degraded power, which not content with destroying its prey, poisons what it cannot feed on.

The salamanders of Europe are small and insignificant compared with those of Japan, as the natives of that country are superior to those of Europe in the strength of their superstitions, and the whole-souled manner in which they are given to idolatry. In China they openly worship "The Dragon," illustrating the degrading character of their belief. With some of us he is a fabled monster not to be believed in altogether; "a bugbear founded on fact;" but with the Chinese he is an Adored Entity.

The salamander of Japan (*Sieboldia maximinia*) is by far the most gigantic of recent Amphibia, and is cruel and savage in its attacks on fish and aquatic animals. Its appearance is sufficiently hideous to deter most Europeans from trifling with it. Its shape resembles that of a much flattened European salamander, with the loathsome aspect of the toad.

What hideous monsters vice and superstitious idolatry are to those who are not enslaved by them! The religion of Japan, is not enhanced in value by the civilization, that accompanies it, which like the small eyes of this great reptile, only direct it how to ensure its prey.

The *Proteus anguinus*, is a creature of everlasting night, dwelling in the subterranean recesses of caverns, in the dark, deep lakes, where few fish exist. Its eyes are in a rudimentary state, but suitable to its life. It breathes both by lungs and gills, like the tadpole and fish in one. It resembles the eel in shape, but has feet somewhat like the newt, and lives on minute Infusoria and ova of fish.

These creatures are the only remaining representatives of the fish-lizards, once so gigantic and powerful, and that played a most prominent part in the prehistoric fauna of our globe. Kirby thinks that these gigantic Saurians may still exist in the interior

of the Earth. These extinct dragons are typical of the greater power possessed by Satan in former ages. The proteus of the ancients assumed many forms; that of our days is the important link between two distinct classes. It inhabits the country of the Slavonian race, and may illustrate their qualities of mind, which show a *protean* power of adaptation to circumstances, savage or civilized life, such as characterizes races, which are either real or apparent hybrids.

The lepidosiren or mud-fish (*L. annectans*, Owen), is a *fish* approaching the *reptile*. Before the dry season they bury themselves in the mud, which consolidates round them in a hard cake. The creature inside forms a sort of cocoon with leaves and mucus, round its body, in which it remains in a state of torpor, until the flush of water during the following wet season, softens the mud, and the animal at once awakes to activity.

The nations of the Gambia are more ferocious and cruel than those of some other districts in Africa; but are more intelligent and independent; thus showing analogy to races higher in some qualities; though they resemble the most savage tribes in their want of tenderness and compassion.

The lepidosiren when hungry, devours its own species. It is an inhabitant of the great river Gambia.

CHAPTER VIII.

THE POETRY OF BIRD-LIFE.

BIRD-ISLANDS—VULTURES—EAGLES—OSPREY—HAWKS—OWLS—SHRIKES—FLY-CATCHERS—THRUSHES—NIGHTINGALE—WARBLERS—WRENS—WAGTAILS—BUNTINGS—FINCHES—CROSSBILL—STARLING—BOWER-BIRD—CROWS—MAGPIE—LYRE-BIRD—UMBRELLA-BIRD—WAXWING—BIRDS OF PARADISE—HUMMING-BIRDS—WOODPECKERS—WRYNECKS—HOOPOE—NUTHATCH—CUCKOO—ROLLER—BEE-EATER—KINGFISHER.

BIRDS amongst Vertebrata, are second in number of species to fishes. It is supposed there are about eight thousand species or "races" of birds, now existing on the globe. They possess greater powers of flight than other back-boned animals. Bats fly, fishes and squirrels attempt it; but their structure does not enable them to soar high; like man's upward spring in his present state. Some flights are dark and bat-like; appropriate to the gloomy caves by day, or the benighted mind when it sleeps.

Insects the creatures of summer days, flutter in the sunbeams, and seldom reach the clouds. They cannot fly like birds, and sometimes helplessly "the sport of winds," are carried far out to sea and perish. Skirting the crests of mountains, they attain great heights, but stop to rest on flowers, which make the way pleasant. Yet their flights—always short-lived, are illustrative of the character of the happy hours of many persons; who only enjoy life when summer-like prosperity shines.

Flying-fish and reptiles pursued by their enemies, start into the air but for a moment. Their flights remind us of the efforts man makes to rise above what surrounds him on earth, and of short-lived human fame.

The flights of quadrupeds, reptiles and fishes, variously illustrate what is gloomy and cheerful in man's aspirations. That of bats, typifies what is most dismal in his expectations. They repose in dark corners during the day, and only flit at night. The flight of the little dragon of the Eastern Archipelago, cannot be called much more cheering. That of the squirrels and flying-opossums is more pleasing; but still not typical of long-continued lofty aspirations.

Aeronauts by their ingenious mechanical inventions, are enabled to raise themselves above their fellows. It is but for a short time they attain their lofty height; they cannot long support themselves in the air; but soon sink to the ground from whence they rose.

But birds can cleave the clouds!
And in their eyes bring down the fulmen!
Divide the wave and feel the coral's breath.

Such are glorious creatures:—

“Join voices all ye living souls; ye birds
That winging up to heaven's gate ascend,
Bear on your wings, and in your notes His praise.”

Birds possess sight surpassing that of any other class of animals. When at a lofty height, the eyes of many survey much that is passing in the world beneath; typical of spiritual intelligences, whose vision is more extensive than that of man.

Some birds like eagles and falcons, are noble in aspect and feed on living prey; and are illustrative of messengers of power and vengeance. Others with a sinister expression, that feed on carrion, are typical of evil agents, whose very breath is corrupt. And some like the dove are sweet and innocent in appearance, and have thus been often accepted as messengers or emblems of peace.

No class of animals is found in so great a variety of places as birds. Where no quadrupeds but seals exist, in the far distant, gloomy, Antarctic regions; where no terrestrial animal lives, they fly and fish; for their rapid powers of motion enable them to leave the country, when the change of season cuts short the supply of food.

Although most birds fly, a few genera are incapable of raising themselves from the ground; yet have some compensation for this defect in being better divers and swimmers, or faster runners than other birds. Some of the *impennis* species in their day, even are masters in the land where they live.

A coral reef rises from the waves; its earliest inhabitants are birds, whose guano contributes to form the soil, in which the first land-plants grow. They are humble weeds, but are succeeded by stately cocoas, which attract rain to the little islet. A home is at length prepared for man, who induced to settle there, covers the island with his habitations, now become the abode of a thriving and lively population who well-nigh extirpate the sea-fowl, and rooting up the weeds, replace them by esculents suited to the wants of Man.

A corrupt state of morals, like the neglect of sanitary laws, saps the foundations of the prosperity of the island. Its human population disappears, and their huts fall into ruin. The reign

of the birds returns, and the weeds regain their ascendancy. In like manner the inhabitants of the great cities of ancient days, as they enlarged their boundaries, drove away the animal tenants of the marsh, which was converted into a garden. Such was the case with the neighbourhood of Babel, which in its desolation was revisited by "unclean and hateful birds," that had no place in its precincts in the days of its prosperity.

Most naturalists are agreed in placing the vultures first amongst birds; and if strength, size and a dignified aspect give this preference, they are surely entitled to it. The birds of prey are eminently illustrative of the different ranks in society. The falcons are more generous, courageous and gracefully formed than eagles or vultures; but are inferior in size. Princes who are not crowned heads, have often higher qualities, than those who sit on a throne. The eagles much larger and more powerful than falcons, typify kings, who are more influential than princes.

Most of these birds of prey, build on lofty eminences, from whence they survey the smaller birds as from a throne. The vultures see farther, and having the most stupendous power of wing, soar higher than all other birds of prey.

They are types of Emperors such as rule Russia, and who have sometimes ruled over large sections of the Earth. Like vultures they delight in slaughter, and are faithful attendants on death and dismemberment. Vultures seemed formed principally for an uncivilized state of society, and "to commune with rugged Nature." They have no place in an English landscape; although the Egyptian and griffon vultures, who have each visited our land, seem to typify the more rapacious among our rulers. Such were William the Conqueror; and the devourer of the dismembered and confiscated Abbey lands;—HENRY the EIGHTH.

Africa is the great stronghold of vultures, and as a rule cruelty and brutality have reigned almost throughout that land; where every kingdom is as it were a *carcase*, and a *prey*.

Four vultures breed in Europe, and appear to typify the four great monarchies of the world.

The Cinereus vulture (*V. cinereus*) is not the largest; but yet is one of the rulers of the East among the birds of prey. It exercises more influence in Palestine and Syria than some other species, which are more European in their range. Such a bird is a type of the old Babylonish Empire.

The Egyptian vulture (*Cathartes percnopterus*) is more widely distributed than the preceding, being found from "India even unto Ethiopia," as well as in Europe. As a bird of brighter colours than the other vultures, it may represent the gorgeous Medo-Persian Empire.

The griffon vulture (*V. fulvus*) is a larger and more powerful bird than those we have just described, and being more characteristic of Europe and especially of Greece, may typify the Empire of Alexander the Great.

The *Lammergeyer* (*Gypaëtos barbatus*) is the most powerful and majestic of all these vultures; and in the form of its wings and claws is like the falcons. In ferocity and strength; it far surpasses any bird of prey on the old continent. They have become scarcer as civilization has progressed; yet they still exist, and should it droop, these ravenous birds may again congregate. If the Grecian Empire is typified by the griffon, that of Rome is illustrated by the *Lammergeyer*, which was so much more powerful, and like this bird, attacked its prey during its life and vigour.

The Sociable vulture (*V. auricularis*) a doubtful native of Europe, lives in *communities*. It is a type of the Socialists, who it is to be hoped will never rule in Europe.

We survey the four European vultures again. Eagles have a place in the arms of France, Russia, Austria and Prussia. Vultures would be more appropriate emblems for these governments.

The *Lammergeyer*, reminds us of the French Empire, as it combines the courage of the hawk, with the power of attaining a great elevation. This bird endeavours to drive weak animals over the rocks, and when their bones are broken, feasts on the carcase. In this it shows analogy with the policy of some Imperial rulers, who endeavour to induce those on whom they desire to prey, to *ruin* themselves. These birds are capable of swallowing an enormous quantity of flesh, and when thus gorged are an easy prey; which shows some analogy with the state of plethora of the late French Empire, whose *very great size* rendered it more easy of attack.

The other vultures feed on carrion, or only prey on what is at its last gasp; while this prefers living prey; typical of the different mode of warfare, pursued by the French and Russian Empires.

The condor (*Sarcorampus griphus*) soars higher and farther, than any vultures of the Old world. Its range extends along the Andes and Cordilleras, which form the so-called "backbone of South America." And well does this giant bird, pick the bones of the carrion of these regions. The land it inhabits, abounds in the grandest scenery in the world, and yet produces little that the moralist can admire.

The land is magnificent and the country imperial, but the people are carrion, and the rulers vultures; and they do not even possess the courage and vigour of their analogues in Europe.

The Incas of Peru and their successors the Spaniards, were surely more admirable than the mongrel Republics that have followed. They were as superior to them, as the condors are to the commonplace Perchers and Runners of the plains.

The condor is an emblem of great empires which have passed away. As it soars to the summit of Chimborazo, it is a type of the elevation to which Ecuador and Peru might attain, in the hands of a vigorous and industrious population.

The turkey buzzard (*Cathartes aura*), we consider to illustrate the character of most of the Republics of South America. It is a cowardly, mean, and *dirty*, but cruel and rapacious bird. It flies craven from the king of the vultures (*C. papa*); it quakes before the giant condor, who himself is held in awe by the smaller yet more courageous harpy eagle; which is a type of the rising Brazilian empire, that excites the disgust and dread of the republican divisions of that continent.

The secretary eagle (*Serpentarius cristatus*) attacks the most venomous serpents of Africa, and is found so useful in that country, as a means of lessening the numbers of species noxious to man, that it has been introduced into the West Indies for a similar purpose, with complete success. The maintenance of the balance in creation, is necessary to its well-being. A country must be greatly disordered, when it cannot rid itself of what is noxious and hurtful, without external aid.

The secretary eagle is a type of emigrants, who carry with them, the means of the extirpation of the vices in the land where they settle.

The eagles are powerful birds, and as a rule illustrate regal state. The imperial eagle (*Aquila imperialis*), does not live within the British isles. We have not had an emperor among us since the days of the Romans. But these birds are found in Algeria, Turkey and Russia; yet they are smaller than our golden eagle (*Falco chrysaëtos*), which is more generally known and admired. Continental writers say the imperial eagle is the finest bird. It is perhaps doubtful which species was referred to by ancient authors, as the emblem of Rome. The vulture, is the type of the supreme power of Rome; but the eagle is the emblem under which their legions fought. It still typifies in the provinces that were once Roman—the hand that holds the sceptre.

We have to thank Germany for our present royal dynasty; who however were descended from the ancient Scottish kings; perhaps typified by the German spotted and golden eagles; alike now considered British.

Let us cast our eyes on Scotland, the home of the eagles and the Stuarts.

In one of the mountainous parts of our island, the true lover of nature hears a wild cry through the sharp frosty air, and beholds "a speck on the sky" descend as a noble golden eagle. The scene is in Perthshire, in a lonely glen or chasm, in hills of mountain limestone; to which a lofty waterfall obstructs the entrance. At risk of life and limb the naturalist creeps along a narrow ledge of rock, holding his breath, and enters a glen surrounded by cliffs three hundred feet high. There is no vegetation on the rocky sides; not a Scotch fir-tree, not a sprig of heather or broom; but a wild wood of dark firs with much heath and broom fills up the bottom of the glen, peopled by the fox, the hare, the raven, the red grouse; and among the smaller birds, the crossbill and the crested tit.

Over this animated domain a pair of eagles reign, the king and queen of all the neighbourhood. This little world is nearly complete in itself. No intruder has for ages disturbed *the sacred bird's rule*: an Inheritance older than the Norman rule; before Graeme broke down the Roman wall; or the days of Ossian. Their ancestors have seen King Edward's conquests, have feasted at Flodden Field and at Culloden! They shriek and fly as man approaches, an intruder on their domain. Their eyrie is on an inaccessible rock, but it can be seen from a higher point with a powerful telescope. Their nest is a vast structure, materials accumulated through many years; but it is not tenanted yet; the winter season is not passed, yet still the birds perch near it, in hope of the dawn of the spring. The eagles not fearing man hover near the stranger, as if threatening him for his intrusion. The grand-birds soar away. He wishes he could command the air as they do.

He returns a month hence.—No eagle greets him with its piercing shriek! He wanders through the valley, and hears nothing but the croak of the raven, or the rustle of the timid hare. He sees the ravens fly close to the bottom of the cliff, on the top of which the eagles built their nest. There an eagle lies stretched on its back, and a raven stands on its corpse, picking out "Those eyes that stood undazzled in the Sun." "He was the Sultan of the Skies, and Earth paid tribute to his Eyrie." But now!—"Imperial Cæsar dead, and turned to clay"!!

The raven would not have dared to have touched the eagle during its life; but now it croaks in gloomy mirth over its carcase. A spirit which reminds us of the coarse levity with which some persons treat the mighty dead. Their envious eyes, like ravens or greedy carrion crows, lust for the gory death of those who rule. Such we fear would sacrifice all that is beautiful and worthy of being remembered in history; all that the noblest.

of us admire in the present day ; all our glowing hope of an active and brilliant future, on a profaned altar, miscalled that of "PROGRESS ;" in truth one of human bones on a foundation of ruin and decay. The sound theory of progress, accepts every blessing as an earnest of a greater one to come ; and hopes that every present possession, may yet be developed and EXTENDED, RATHER THAN DESTROYED.

The different inhabitants of the glen which we have above described, and the eagle rulers themselves, we have compared with a Kingdom. Britain had Kings and Chiefs, before the appearance of Cæsar, and if Her civilization did not reach the Roman *altitude*, still Her inhabitants were highly cultivated compared with the *really barbarous* nations of the nineteenth century. The British eagles typified Caractacus and Boadicea. The savages of remote regions of the earth, with whom some Ethnologists are quite willing to class our ancestors, are indeed primitive and rude in their habits. If we seek for types of men in birds, we can only compare the savages of the North, with the puffin and the guillemot ; and those in the South with the penguins.

The white-tailed sea eagle (*Aquila albicilla*) often breeds on the cliffs within view of the sea ; and lives on fish, or on any prey it can get either alive or dead.

The "Sea Kings" of Norway were eminent fishers, and like this bird were bold and courageous and ruled over the less vigorous "*Ichthyophagi*," as these eagles do over the gulls and puffins.

The osprey (*Pandion haliaetus*) which lives exclusively on fish, is nearly extinct in these islands. It is a smaller and less noble bird, than the golden or white-tailed eagles. It is a type of the remnants of the Finnic population of the British Isles, who were so devoted to a fish diet : from all we know of them, they appear to have been a quiet race of little enterprise compared with the prototypes of the *true* eagles.

The spotted eagle (*Aquila naevia*) is a much smaller and more insignificant species than the preceding, and feeds greatly on insects, toads and other vermin, and is thought by many "a vermin" itself. Yet it belongs to the noble eagle class ; which is seen instantly, when it is compared with the buzzard. It has far more spirit and courage than that bird ; and is perhaps for its size, not inferior in this respect to the larger eagles.

We consider this species, typical of the princes of Germany, allied to our royal family.

The falcons are a magnificent division of birds ; for they exceed all other birds of prey in grace, high spirit, harmony of colour, penetrating glance and refined aspect. Their gentleness

in captivity is not less than their courage; and they are in a high degree susceptible of education. We may search the whole avifauna in vain, to find birds which equal them in attractive qualities. We consider them a type of nobility, who from ancient times have been the attendants of royalty. They like the falcons, are different in degree of rank as well as of character.

There are three species or races of jer falcon, which stand at the head of their order for size and beauty: for when trained by the falconer they are a match for the largest game birds, such as the heron, the bustard and the goose. The various falcons according to ancient writers on the "noble sport," were appropriated to different ranks in society. Thus the eagle, merlin and vulture, belong to the Emperor. The jer tercel to the King; the gentil falcon or goshawk to the Prince; the sparrow hawk to the Priest; and the kestrel to the Servant.

The jer falcon may well wait on the king, its strength and beauty rendering it so noble in aspect. Those who are *high* in rank, wait on those still Higher.

The jer falcons are "flown at" large birds, hares and other small quadrupeds, which they kill by striking their talons into their brains. The most highly trained hawks, do not kill their prey, but bring it down alive to their masters. These accomplished birds, typify those individuals who unite High birth with fine qualities; and with the aid of natural and acquired gifts, attain a lofty position. They soar as it were like these birds, and "bring down applause from the very skies they pierce and break."

The peregrine (*Falco peregrinus*, Linn.) true to its name, is a wandering bird, and has all the fine qualities of the other species; but is even more gentle and easily managed than the jer. It too is "flown at" herons, ducks and other large birds, which it pursues with the ardour common to all the genus. This activity is typical of the energy which many of our Nobility display; who also like the peregrine visit most countries of the world. Many Englishmen, like swallows, migrate at certain seasons of the year; and like the sea gulls are at home on the waters.

The merlin (*F. aesalon*, Tem.) was in the medieval times appropriated to emperors, and from its graceful motions, beautiful markings, spirit and activity, may in truth remind us of a page of noble birth, in attendance on a "King of Kings."

The orange-legged falcon (*F. rufipes*, Bech.) is a beautiful little species. It is rarely found in the British isles, and typifies a gentleman in waiting or a nobleman at court; it having the grace and attractive qualities of those of higher rank, with-

out their power. The orange-legged falcon has not as much spirit as the merlin.

The kestrel (*F. tinnunculus*) is a fine bird, although its commonness renders it less valued. It is not so courageous as the hobby or the merlin, and is less noble in its prey, being more devoted to an insectivorous diet. It was appropriated to the servant in the palmy days of falconry. It is perhaps a type of the ruined gentleman, who is compelled to take a menial's place.

The sparrow hawk (*Aster nisus*) is a prettily-marked bird ; dark on the back and light on the breast in accordance with the costume of the priest, to whom it was formerly assigned. It is by no means a contemptible bird when trained for the field, but does not show the elevated spirit of a true falcon, as it belongs to a lower class.

The goshawk or gentil falcon (*Aster palumbarius*), although belonging to this inferior family, yet is so courageous, docile and graceful, that it has always been one of the most esteemed species for the chase. It possesses great strength, and in this respect nearly equals the peregrine.

It may be a type of the private gentleman, who has risen to the rank of a nobleman and personal attendant on the king or prince.

The buzzard (*Buteo vulgaris*), appears a coarse and vulgar bird when contrasted with the falcons ; and it is a type of the man of low birth and coarse manners.

This bird resembles in character a bully of the lower class. It shows a willingness to fight a little merlin, which is less than half its size. But the little bird boldly coming to meet the *giant* ; the latter is seized with terror and does not wait its approach. The buzzard is ignoble also in its diet, feeding much on insects, frogs, toads, lizards, mice and the young of small birds ; those even as large as the partridge, it is afraid to attack, for fear of the mother.

The honey buzzard (*Pernis apivornis*) is the most exclusively insectivorous of the birds of prey, but it will occasionally eat reptiles and young birds. Its common prey however consists of insects of the hymenopterous order, to which it is very destructive ; some hundred nests of bees and wasps being probably destroyed by one bird in a single season. It is as cowardly in disposition as the common buzzard ; but is more elegantly shaped and richly coloured.

The honey buzzard is typical of the well-dressed thief, who entering the garden in the guise of a visitor decamps with the bees. The arts and devices of thieves, are sometimes useful to the honest members of the community. This bird plays a

similar part, when it destroys the nests of those robbers of the orchard,—the wasps.

The kite (*Milvus regalis*) like many petty oriental sultans, is regal only in name; and as they often are, is handsome and graceful, but treacherous and cruel to those who are in their power. The kite although possessed of much greater strength, yet fears to attack the hen, whose chickens in an unguarded moment, have come within reach of its claws. A timid mother when outraged by the loss or danger of her young, becomes fiercer than a beast of prey.

Again the kite is like a robbing Turcoman tribe, who cunningly approaches to capture those straggling from the caravan; but when perceived and chased, flies.

The harriers (*Circus*) are so called from their habit of beating the covers for game, like dogs. They are a genus very destructive to young birds, in the moorlands and marshes. They are slow, but easy and powerful in flight, and are very courageous, being ready to attack and kill full-grown pheasants and partridges.

They are a type of those who show great vigilance and perseverance in discovering an enemy, as well as equal determination and dash in assault. The Celtic-Scandinavians have this combination of qualities, and produce the best light troops in the world.

The owls are all birds of prey, but in Britain, only the smaller species have those nocturnal habits, which are popularly considered characteristic of the genus. They have been justly said to resemble the feline race amongst quadrupeds, the smaller species of which are also more crepuscular than the larger.

The owls which are soft in their plumage, stealthy and noiseless in flight, remind us of smooth-furred quiet-moving cats, which have also fierce eyes and very great strength and elasticity of form, in proportion to weight. Both have sharp claws, which they use with great effect to tear their prey.

The eagle owl (*Strix bubo*) is a truly formidable looking bird, having the ferocious aspect of the owl, with the size of the eagle.

If the eagle amongst birds, represents the lion amongst beasts, so the eagle owl does the tiger; for scorning the nocturnal habits of its smaller relatives, it attacks its prey in the daytime. This species when annoyed barks like a dog.

Minerva the goddess of wisdom, war and the liberal arts; according to classic mythology was produced from Jupiter's brain without a mother. The owl was sacred to her, and has been "the bird of wisdom" ever since.*

* The bird of Minerva Mr. Tristram thinks to be *Athene meridionalis*. "Land of Israel," p. 67.

There is a certain staid and venerable aspect about the owl, which inspires respect and dread, in the superstitious who hear its note. As it hoots from the desolate tower, melancholy sensations rise in the listener; for the mouldering glories of a past age, start into remembrance. The green ivy illustrates what they once were;—the “moping owl,” the grief which man feels on the decay of greatness.

The owls as a class, typify the House of Peers, and the eagle owl has been compared with the representative of that body, the Lord Chancellor, from the mixture of gravity, sternness and vigour in its deportment.—This bird is called by the French the “*Grand Duc*.”

The owl can punish with hardly any effort, the contumacy of smaller birds, and can dart upon aggressors like an arrow tipped with “grey goose-quill;” which we may liken to a mandate of the Court of Chancery.

The brown owl (*Strix ulula*) appears small after the eagle owl, and is common if not abundant in the woody districts of England. Its voice is louder and more doleful than that of any British species, and in the ears of the superstitious, sounds like the mutterings of an evil spirit. It is less beautiful than some of its tribe, being exceedingly stout and clumsy in external appearance, in which it exceeds almost every bird of the robust family to which it belongs. Its habits also are less noble, than those of the larger species.

We see analogy between it and some of the inferior Peers; who by success in farming, fisheries and county jobberies, manage to elevate themselves from the position of country gentlemen, to that of members of the Upper House. They are useful to society, but are surely not in the first rank even of the Barons.

The white owl (*Strix flammea*) is typical of a still humbler member of the house of Lords; one who has made money by cotton, and cannot leave off his cotton robe. This species of owl, shows much that is downy and cotton-like in plumage; and its back is marked like a “chaste” popular print.

The snowy owl (*S. nyctea*) is a noble creature indeed, but scarce among us. It is beautifully marked and graceful, and typifies our choice Scandinavian Peers, whose ancestors early migrated from the frozen north.

The snowy owls vary in tint, some being whiter than others. The brown bars with which they are all more or less marked, typify the popular or earthy sympathies of their prototypes, which vary so much in degree.

These birds’ feet are beautifully feathered, and their touch is light; but their claws are sharp, and timorous hares are caught

by them for food. These habits illustrate the sporting tendencies of the English nobility.

The House of Peers like many of the owls, is *most lively* at night; being able it is thought, to see into matters best in the dark.

The shrikes (*Lanius*) amongst birds, illustrate the trade of butchers among men. They are as fierce in proportion to their size, as any birds of prey. They mangle small birds, mice and insects, and impale them on thorns for use, as butchers do their meat on skewers.

From the lofty and elevated falcons and owls, the descent to the shrikes, is very great and abrupt. They are connecting links between the great birds of prey and the insectivorous and omnivorous birds, called by Linnæus, Passeres. There is more of every-day life about them, than about the great families; which are the *aristocracy* of bird life. The shrikes have the air of true *Bourgeois* and display the petty vices of such. They are however pretty birds.

The grey shrike (*L. excubitor*) is a *blue-backed* bird, and may be likened to the butcher's boy in his blouse; while the red-backed shrike (*L. collurio*), may remind us of him, after his work is done.

The flycatchers (*Muscicapidæ*) have a large bill. Their French synonym *gobemouche*, is applied to those who show great facility in believing that class of stories which are "told to the marines." These tales are like the flies which the "*Gobemouche*" catches and swallows so readily. The blue-bottle flies that buzz round our heads, are like the tales that amuse those who have a moderate share of credulity, but are "literally devoured" by the persons to whom we have referred. The incredulous turn from them with distaste.

Two species of flycatchers are found in Great Britain. The spotted flycatcher (*Muscicapa grisola*) is by far the largest and most abundant British species. It builds a neat, mossy nest, which it places in a hollow tree, or often wherever a resting place can be found.

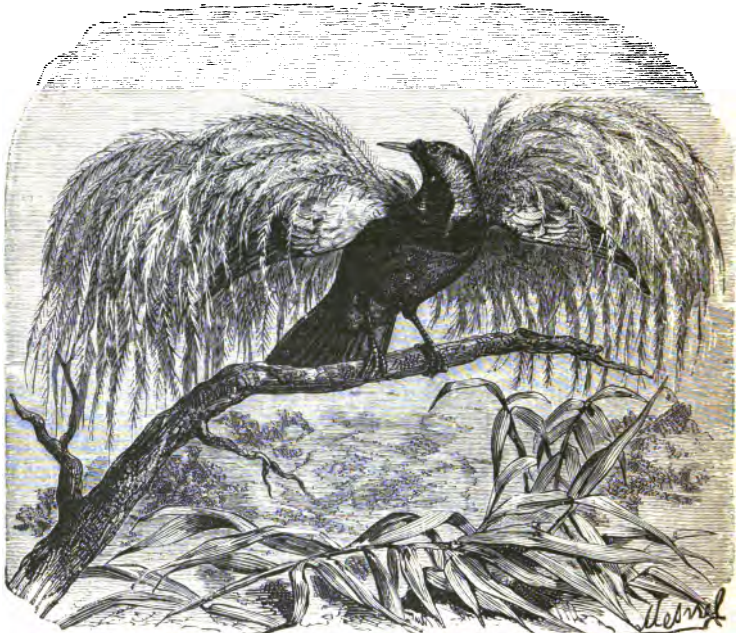
The true *gobemouche* among men, is easy in his mode of life, and can make himself at home in a great variety of localities; such as even at the angle of a lamp-post in a town; where its prototype has been known to build its nest.

The pied flycatcher (*M. luctuosa*) is not abundant in Britain. Were its good qualities for the table as well known to our epicures, as they are to those of Italy, it would stand but a poor chance indeed.

It is a type of credulous individuals, devoted to the pleasures of the table, upon whom a host of smaller epicures live. Like

those who live too exclusively on the birds, they impoverish their supporters ; since if they are resolved to *live on them*, it is quite certain they cannot *long* live for them.

The thrushes (*Merulinae*) with which we commence the singing birds, include some of our best songsters. Mellow, rich-toned singing is heard from them ; but not great compass or variety of tone. Their song has a crude, fresh, country sound, reminding us of those persons who have ordinary but melodious

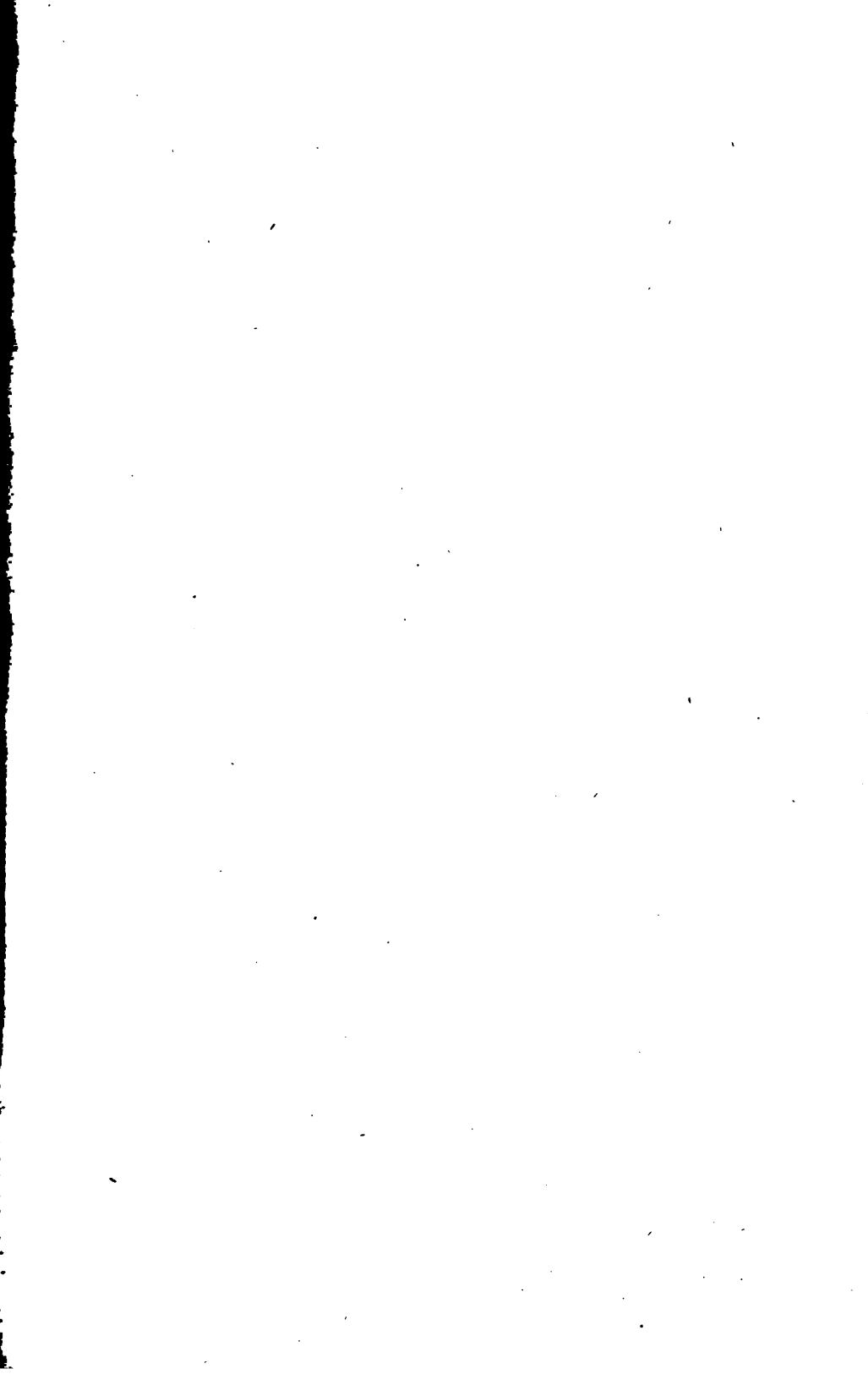


EMERALD BIRD OF PARADISE.

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voices ; not cracked in endeavouring to imitate the more lofty and elevated "Swedish Nightingale."

The song of the missel thrush (*Turdus viscivorus*) has a clear mournful sound, and is heard most loudly on the approach of stormy weather. It is like that of the broken-hearted, who yet sing in mockery of their woe. It also reminds us of the strapping country youth, who in a gloomy evening in February, pours out a mournful, though not inharmonious strain to the cold east wind ; as he tends his sheep on the hill-side, skirted by a thick wood.



BRITISH NESTS FROM NATURE.



Hawfinch.
Long-tailed tit.

Golden oriole.
Long-tailed field-mouse.

Crossbill.
Chaffinch.

The voice of the song thrush (*T. musicus*) is one of the most pleasing that we commonly hear. Its melody is both cheerful and sweet, and has just sufficient plaintiveness to move our tenderer feelings without drawing every chord of our affections, and opening every old sore, which time and change of season had healed.

The song of the thrush inspires us with pleasant emotions, for before the winter is passed its strain begins. In like manner a pleasant change may pass over our feelings; for in the midst of trouble our spirits may begin to rise, although the relief has not yet come.

The blackbird (*T. merula*) has a black body and a yellow bill. It is shy, not easily caught, and whistles well, apparently without any effort. Its song in our opinion, is superior in quality to that of the thrush; being richer and having more of the bubbling music of the waterfall.

The blackbird may be compared with a whistling girl, shy and skulking, but withal pleasantly attired in modest black, and with a complexion tinged with saffron.

The golden oriole (*Oriolus galbula*) is a rare visitor to Britain, but breeds abundantly in Italy. It has a round, flute-like voice; exceedingly pleasing and attractive; but the bird is dirty and awkward in its habits in a cage.

It reminds us of the gay Italian operatic singers, who also visit us in spring. With all their excellence in music their habits and morals, are often such as we cannot admire.

The dipper (*Cinclus aquaticus*, Bech.) is a most interesting bird in the localities where it is found, enlivening the mountain streams and pools, by its diving and sporting habits in the water. It makes a large nest somewhat like that of a wren; perhaps within reach of the spray of a mountain waterfall. It has been accused of devouring the ova of the trout and grayling; but careful examination demonstrates that it more frequently feeds on the larvæ of beetles and dragon-flies, which are more destructive to ova than this little bird could be, if it lived entirely on them.

In some of the mountainous parts of our island its song may be heard, where perhaps from the scarcity of wood, no other bird cares to reside. Its strain has a peculiar and unique beauty among the notes of British birds. Heard in its native wilds it is pleasant, like the sound of the bagpipe or an old Gaelic song; but transported from its *home* it affords little pleasure.

The hedge accentor (*Accentor modularis*), one of our commonest birds, is lively in voice and motion although unobtrusive in colouring. Its song is monotonous, but possesses some of

the notes of the skylark. In the aviary it learns easily the notes of other birds, which it mixes up with its own in a confused manner, spoiling both. It sings loudest when quarrelling with one of its companions, in which it reminds us of a tattling female, who picks up stories, but cannot repeat them perfectly; and who raises the tone of her voice, and endeavours to talk down those who oppose her. This class of persons generally hang as it were on the skirts of those they respect, and to whom they are willing to pay the most servile attention.

In like manner the hedge accentor, devotes itself to hatching the egg which the cuckoo—a great bird, lays in its nest. The young cuckoo makes its appearance before the young accentors, and soon turns out of the nest any hatched birds, or eggs, and thus becomes sole ruler.

This episode in bird life, is frequently illustrated in the case of foster children, who are often like the young cuckoo grasping and selfish; and ungrateful at last even to those who have nourished them.

The robin (*Sylvia rubecula*) is supposed to have a certain sympathy with man, which is doubtless the foundation of the friendly feeling, which he so often shows towards the bird; for in summer and in winter, it fears not to approach Man's dwelling. In the warm season it builds in his flower-pots and outhouses, and when the soil is under the iron covenant of "Jack Frost," the bird comes near, in common with pensioners of human kind, to receive the Christmas dole.

If bold with men, it is pugnacious with birds of its own size, which it generally drives before it. Its own species comes in for a share of its attacks, which are mostly desperate, and often end in the death of the weaker robin.

The bird's analogue,—a frank, generous and brave character; walks boldly up to his superiors, but in a conflict with equals fights till death.

From the most ancient times it has been the fashion to admire the nightingale (*Sylvia lusciniæ*) notwithstanding its dusky plumage. This preference is owing to its song, which far transcends that of any other bird. Tourists go a pilgrimage to hear this bird, just as they do to enjoy the song of some favourite *Cantatrice*; and plain features and obscure costume do not prevent her voice from being admired.

The russet colour of the nightingale is composed of a variety of brilliant hues. Under the veil of modesty transcendent merit may be concealed; and glaring colours often deck immorality: yet when we come to dissect this dusky veil we find what is bright and beautiful intermingled. In natural objects it is a rare exception to see great extremes united in one individual, and

in human beings, this is not more frequent. Our most beautiful singers are often unsymmetrically formed, owing to their mental and physical constitutions, presenting great excess and deficiency of development:—such peculiarity accounts for their talents and their defects.

The music of the nightingale is the concentrated beauty of the song of a variety of birds. Its executive power, is equal to the quality of its tone and extent of its scale. It combines the mellow plaintive sweetness of the woodlark, with the sprightliness of the skylark, and the essence of the other warblers of the grove. Its voice is believed to be more *pene- trating* than that of any other bird, for it can be heard at the distance of a mile, which is as far as the voice of man can reach. According to the anatomist Hunter, the muscles of its vocal organs are proportionately stronger than those of other birds. The late hour at which it sometimes sings, enhances the effect of its voice; for most birds are then at rest. IT THRILLS THROUGH THE STILL AIR AN EVENING SOLO, TO CONCLUDE THE DAILY CHORUS OF ADORATION WHICH NATURE IN HER BEAUTIFUL AND VARIED LANGUAGE, POURS OUT TO HER CREATOR.

The nightingale as the representative of singing birds, is wisely given the first place. Its song rises to Heaven, in contrast to that of the skylark, which appears to come down from the clouds. The song of the nightingale so admired in Germany, in its variety, sweetness, power and soul-stirring tone, reminds us of German or Scandinavian music; which is elevating and pleasant to hear, and possesses more of an *intellectual* character than the luscious but sensual music of Italy.

Let us consider what birds please us most by their song. Not the birds of prey;—vultures emblems of “world-power;”—falcons of Nobility and Gentry;—owls of Chancellors and Senators; or the other divisions of the great birds, which personify our most influential classes: but these little dusky genera, such as warblers and thrushes, yield the best song.—*Prima donnas* generally originate in *low life*. These little songsters’ voices, being louder than those of the great birds, illustrate how what is smallest in size, may produce the greatest effect. The ear, the medium by which sound is conveyed, not being regulated by the same rule as applies to sight.

The black-cap (*S. atricapilla*, Linn.) stands next to the nightingale in beauty of song, which it is said to imitate, and is thus called “the mock nightingale.” It greatly exceeds that bird in beauty of plumage, but its song though similar in character is vastly inferior. In Germany it is called the monk, from the black head of the male; while the female has a red head.

If the nightingale represents the *Prima donna*, the black-cap or "mock nightingale," reminds us of the comic singer, who does not possess such high qualities, but is still admirable. In the "comedy of birds," the little black-cap, could play well the part of the friar.

The white-throat (*S. cinerea*, Linn.) an exceedingly graceful bird and a good songster, resembles the nightingale in song and plumage. Being more generally distributed it oftener contributes to our pleasures. If the nightingale resembles the singer with an "Uncommon voice;" the white-throat may be compared with the vocalist who is found in most places with a good ordinary voice. He may be esteemed the "Nightingale" of his district, but is far inferior to the *true bird*.

The reed-warbler (*Salicaria arundinacea*) has an unattractive and singular note, and a sombre plumage; but it has an elegant shape, and is an interesting bird in its habits. It climbs among the reeds, as actively as a mouse to its ingeniously built nest; which is one of the most curious of any British species. It passes the winter in Africa, and the summer in these islands.

It illustrates the quiet dame, who can execute ingenious works, but who has a third-rate voice, which yet finds admirers. She is modest in her attire, and active in her habits. She travels to the south in winter, but enjoys the northern summer.

The migration of birds is very important both as a fact and as a type. Hundreds of species visit various countries at different seasons in search of food, going north in summer, and south in winter. This is eminently the case with the *Anatidæ* or ducks, which find sustenance in the wonderfully rapid development of organic life, occasioned by the great length of the summer days in the Arctic regions. The immense number of insects and mollusca, found in Lapland and other northern countries in summer, accompanied by an equal proportion of birds occasions much astonishment to the visitor. When the cold season approaches, these birds leave Lapland for Southern regions, where the development of organic life, is not so much checked by the approach of winter.

These different migrations remind us of Emigrations amongst human populations; whose movements are also influenced by the supply of food. The roving habits of some quadrupeds, well illustrate those of nomad nations, who do not cross the seas: and the passage of birds, the emigrations of human beings to countries beyond seas. Man *migrates* in his Youth, his "Summer of life" to some Northern country which has great resources, and in his "Winter" having fulfilled "His mission," he returns to the south. Men born in the north though settled in the south, pant for their native air, which they must

respire if they would recruit their strength. In like manner many birds *re-visit* the place of their birth. These different changes from one climate to another, are favourable to the increase in numbers and prosperity of man and animals.

The wren (*Troglodytes europæus*) is found in every country in Europe, and is well known for its small size and activity. It is fond of comfort, and accordingly makes a snug nest, which varies in materials with circumstances; but is always enormously large in proportion to the minute dimensions of the bird. Being exclusively insectivorous, and especially fond of caterpillars, it is of immense benefit to the farmer and gardener; both in summer and winter. In the latter season, although insect life is in many cases dormant, yet the eggs, pupæ, larvæ and imagos of the insect tribe in a state of hybernation, are procurable by the indefatigable wren. It hunts many a nook and cranny of hollow trees, ivy, outhouses and thatched cottages; and in finding there a sustenance for *itself*, increases that of Man.

The wren is a robust and most prolific bird; and is a type of those stout-bodied persons who are "blessed" with large families, but who are like themselves under the ordinary size. They are comfortably cared for in their warm habitations by their industrious parents, and are like the wren eminently beneficial to society.

The more ignorant among the Irish, have a great hatred to the wren, which is one of their best friends, and is like its type the reviled but quiet Saxon settler, too frequently a victim to cruelty or revenge.

The golden-crested wren or kinglet (*Regulus cristatus*) is a little bird of graceful motions, beautiful colouring and pretty form. Its note is weak and monotonous but pleasing, and its habitation is truly the most exquisitely finished of that of any British bird. They have been called "kinglets" on account of their golden crown, but they surely are amongst the smallest and feeblest of birds. Most species that feed on insects are very easily killed on the approach of frosty weather, and both the common and golden-crowned wrens are especially so.

It is not so prolific as the common wren, and is a type of elegant young princesses, who are without much character or power, and are delicate and susceptible, although they wear a golden diadem.

The pied wagtail (*Motacilla Yarelli*) is a lively species, which frequently crosses our paths as we wander by the water-side, chirping, and wagging its tail. The contrast of colour in this bird, like that of the wheatear, is agreeable to the eye. It is also very useful being almost entirely insectivorous.

It reminds one of a graceful young lady in half mourning, who perhaps wishing to appear sentimental, is in reality on "the look out." She crosses the paths of men she meets, giving at the same time an undulating motion to her skirts, while she turns her head round to look after them; the exact motions which we have frequently observed in this bird.

The little tits (*Parus*) are a small, active, hardy, but lively and amusing class of birds, which exceed all others in fecundity. They possess a great amount of courage, and fly when hungry upon birds a great deal larger than themselves, attacking them and splitting open their heads with their powerful bills, and eating their brains.

They remind us of spirited little dwarfs like the famous Hudson, who was formidable even to those quadruple his size. The Scotch say of the tits, "they have a drop of the Deil's blood in them," to which they attribute their savageness in attack. They have large heads, a peculiarity in common with little men of spirit. Their necks also are very thick, like those of many fathers of large families.

They are interesting birds, from their extreme impudence, for they venture to hiss at man's approach; and bite his fingers when put into the nest. A similar pugnacity is shown by small people in the protection of house and family. They hiss like this little bird, and stand on tiptoe with consequential air.

The song of the titlark or meadow pipit (*Anthus pratensis*, Bech.) is much above the average of singing birds, but is not extreme in any single quality, although varied in tone, and is less powerful than that of any of the lark genus. If the nightingale is "the master" or teacher of song to the more imitative birds; so the titlark is "the junior teacher or mistress of music," its voice being capable of exercising so great a variety of movements, in an ordinary manner.

The skylark (*Alauda arvensis*, Linn.) certainly one of the most agreeable cage-birds, is sought for with great diligence by fowlers. In one respect its song surpasses the nightingale or any other bird, that of *aspiring loftiness of tone*. It is pleasing to watch it soar, singing as it rises on high, until it is lost to human sight. But it cannot leave the Earth from whence its subsistence is derived, or remain long in its high position. Neither can Man when elevated on the wings of his imagination, for he must soon descend again to the dull commonplaces of every-day life.

The great height to which the lark attains, does not prevent it from being devoted in its attention to its young; which it is unwilling to forsake even in time of danger. Parents whose

"aspirations are lofty," are careful to *fulfil* their every-day duties ; and most earnestly desire the good of their children.

The woodlark (*A. arborea*, Linn.) has a mournful, sweet and plaintive song, that moves us more than any bird's. Burns compares it with the sighings of a broken-heart, which is not silent in its grief, but pours forth its feelings to be echoed by the woods. Its mellow notes are so like the moanings of wind through reeds and water, that it might well have been sacred to Orpheus.

The common bunting (*Emberiza miliaris*, Linn.) is a clumsy bird, compared with many that we have previously mentioned ; being thick-billed and heavy-bodied ; and has an unattractive song. It is a shy and rustic looking bird ; and its thick body reminds us of an awkward ungainly clown, whom no one admires ; but who has just sufficient sense to avoid falling into every trap.

The yellow-hammer (*E. citronella*, Linn.) has a faint resemblance to the canary, but is much larger and more clumsy. Its great abundance makes it little esteemed ; otherwise it would be caught, and prized as a cage-bird. From the curious noise it makes, when its eggs are taken, it has been supposed in Scotland to say ; "Deil, Deil, Deil, take ye." Its brass-like colour is appropriate to a creature which is the subject of this superstition ; false gilding being one of the means of rendering what is otherwise *vile*,—BRILLIANT.

The house sparrow (*Fringilla domestica*) is a very prominent member of the class of finches, a division of small birds, which possess for their size, a large amount of spirit and self-importance. The sparrow is a lustful little bird, the most impudent of the small bipeds, and universally acknowledged to be the emblem of small specimens of the Great *biped* Man. They are prolific and pugnacious, but puny, mean and insignificant in their doings ; yet their very insignificance, protects them from the attacks of the noble-minded of our race.

The cock sparrows fight in a peculiarly bold manner with each other ; which certainly typifies the contests that take place, between the mean but quarrelsome members of our species. They are clever birds, and show much skill both in thieving and in performing tricks ; and were they less abundant, they would be more admired, notwithstanding their dusky colour ; particularly in towns where the smoke begrimes the rosewood-like markings of their plumage.

The sparrow has been too much persecuted, for it is especially useful in devouring the seeds of many weeds, which would otherwise choke the land. We should not desire the disappearance of these little birds and their human analogues, who are so

useful in picking up many trifles, that might otherwise grow into gross abuses. GREAT PEOPLE CANNOT ALWAYS ATTEND TO SMALL THINGS.

The goldfinch (*F. carduelis*, Linn.) one of the most sprightly, elegant, neat and clever common birds, is universally a favourite. It is even more capable of being taught tricks than the sparrow ; and its brilliant plumage and restlessness, render it an interesting bird to keep in a cage.

The goldfinch reminds us of an agreeable, sprightly, singing, dancing, juggling little man ; much admired by the ladies ; who like their female types of several of the other finches, are often ready to mate with such an one. The goldfinch in captivity, unlike most other small birds will pair with two or three female canaries in a season, the young of which are also prolific. The men typified by the goldfinch, are neither very chaste nor very constant. This bird forms a very beautiful nest, strong and more compact than that constructed by most other birds, being very ingenious ; like those flippant men who are so clever with their fingers.

The chaffinch—*Fringilla cælebs*—i.e.—bachelor finch, is so called from the males arriving in flocks earlier than the females. It is a lively bird, and its plumage is bright ; hence the proverb “gay as a chaffinch.” The nest is admirable in point of taste, choice of material, construction and strength. It is of an elegant cup-shape, garnished most carefully with lichens, and its eggs are likewise beautifully marked. Its song surpasses that of the other finches ; but it is not at present fashionable in England, yet in Germany they admire it more than any other song-bird, except the nightingale and skylark ; and classify it into a dozen different varieties. The bird is very clever in learning the notes of other birds, and becomes very tame and docile in captivity.

The goldfinch reminds us of the French character with its varied accomplishments ; while the chaffinch does of the German and English ; who take such special pains to adorn their homes. Some birds make very rude nests, or none at all ; while others take the greatest pains, not only to build a comfortable, but elegant home. In which they show analogy with those nations and individuals, whose tastes and habits stimulate exertion ; in contrast with those, who like savage tribes, care only TO LIVE ; and rear their offspring in the rudest manner.

The bullfinch (*Pyrrhula vulgaris*, Tem.), is a very prettily coloured bird, but is of a stouter body than some of its family. It is pugnacious, and will not allow familiarity from the other inhabitants of the aviary. Like the “bullies” among human beings it is *black* about the mouth and under the eyes, and *red* about the neck ; illustrative of its character and quarrels. The

bullfinch has little song of its own, and that of an inferior character, but readily takes up any other song, and may be taught to whistle a variety of tunes; but such a bully is a short-lived bird. A combination of musical and pugilistic tastes, is seldom compatible with long life. The song of the bullfinch is principally artificial. It is like the language of men of the bully class; who are as counterfeit in courage, as they are shallow, and inclined to copy others in speech.

The canary (*F. canaria*), a bird whose song rings in every house in Germany, is very generally kept in Europe as a cage bird. It was introduced from the Canary Isles, and like many species of animals in a domestic state, it has mostly lost its original colour. Black wild-cats, rabbits or fowls are unknown; neither are yellow canaries found in a savage state. The canary has a good natural voice, which varies much in individuals as amongst men; and is also susceptible of a high amount of cultivation.

Canaries that are mottled on the upper part of the body, and have a yellow breast, are the strongest and healthiest, in which we see an analogy with those hardy breeds of horses, that have dark manes and lighter coloured bodies.

The canary is a type of the yellow Portuguese of its native islands; and in Europe of the Coloured Serenaders. They can only reside in our country with the aid of great precautions, being natives of a warmer climate.

The crossbill (*Loxia curvirostra*) has a most peculiar and very powerful beak, the upper and lower mandibles of which transverse each other, which gives it great power in splitting fruits and seeds. It destroys quantities of apples for the sake of the pips alone, which would render it a most destructive bird were it sufficiently common. When young it is florid and red, but enjoys a *green* old age both literally and figuratively. It has been vulgarly supposed to be a Sacred bird, from the absurd fiction of its having twisted its beak, in the endeavour to extract the nails from the Cross of our Lord; and is said to have acquired in consequence the power of healing diseases, particularly epilepsy. The water left by these birds in their drinking troughs, is swallowed for this purpose by some classes of German boors.

This bird is a suitable type of distorted superstitions connected with "The Cross." Such may last the age; although as time advances they will lose their influence. It is singular that this grotesque species, *should breed in the first month of the year*; earlier in the season than any other bird. The appearance of its young in the cold, dark season, is significant of the winter or early spring of a nation's history, which is favourable

to the HATCHING OF SUPERSTITION. Successful incubation at this early season, is greatly encouraged by the highly carbonized character of the food used by these birds; which consists greatly of the seeds of the pine and other cone bearing trees: this enables them to support a great degree of cold. This incubation is a suitable emblem of dark, early days;—the January of Knowledge and Development of Life.

The starling (*Sturnus vulgaris*, Linn.) is a wise-looking bird, and clever in all its tricks and ways; for it may be even taught to speak. It is a strong species, formidable to smaller birds, at whose nests it pecks, and whose eggs it eats. Its plumage is of a dark colour with yellow specks, which is appropriate to a bird of an intelligent though thievish character.

It is a type of a pushing, enterprising person, rather important amongst the lower classes, but small amongst the great. He is talkative rather than eloquent; and has an excessive air of vulgarity, without the beauty and grace of the magpie's prototype. He has the avaricious propensities of the family to which he belongs; and has little respect for the rights of others.

The bower-birds allied to the starlings, construct an extraordinary "run" or wreath of sticks, under which they rest. This is decorated by the birds, with shells, feathers, or any thing bright or shining; the object of which appears to be sport. It reminds us of a bowling or playing alley among ourselves; and proves that birds are capable of exerting themselves, to procure pleasure and amusement as well as food: an analogy which would appear to pervade every department of Nature. Whales, porpoises and young animals almost universally sport like children, and even the old, when accompanied by their young, have their sportive tendencies. This bird has evidently an "eye to the picturesque," as the "bower" is not its breeding-place.

The starling is a type of a tradesman, while the crows by their larger size and greater powers, show analogies with the members of "the learned professions;" who like them are highly intelligent. Their plumage is principally black, like the coats of these learned bodies.

The raven (*Corvus corax*, Linn.) the head of the crows, represents the Lord Chancellor, the chief of the legal profession, as a spoiler and plunderer of other men's estates; while the eagle-owl typifies him in his legislative capacity. The raven is greedy, ravenous and gluttonous; and glories when large and powerful animals are "brought to grief;" picking out their eyes ere they are dead. Like the Court of Chancery they delight in trouble and distress; for such may end in death and spoil.

A stray sheep falls from the cliff and breaks its limbs ; and as it lies moaning, the ravens come and croak about it ; ere its last gasp they perch upon its body over which they stretch their glossy wings. This adds to the helpless creature's agony ; it sickens and tries to turn away those eyes from the gloomy bird of prey, soon to lie seething in its maw.

This dying sheep's horror reminds us of the death-bed scene of an old man. His pulse is feeble, which leeches do not strengthen ; his estate is somewhat confused ; and his ideas begin to reel ;—but it is too late for the settlement of his affairs. Before his mind the Blackgowns of the Court of Chancery fly like ravens, who he knows will part his substance when he is dead ; for they are insatiable.

The raven loves to pick up gold or other shiny metal to carry to its nest. It is often a thief ; although the bird *generally*,—and “The Court,” *always*,—escape unpunished.

The carrion crow (*C. corone*) resembles the raven so much in form, colour and habits ; that it may be called “a smaller edition of it.” It is a type of the ordinary members of the legal profession, who are so useful in assisting to keep in check malefactors, rogues, swindlers, and all who would do injury to society. The carrion crow prefers decaying flesh to that in a fresh state, which it hides in holes. Its habits are well described by Harrison Ainsworth in his song ; who also saw the analogy between the bird and the man of law. He says of the crow, “The fouler the offal, the richer his prey ;” and rightly observes that it “cannot hang too long for him.” Which is emblematic of the *dreary length* of many cases in the lawyers' hands.

The rook (*C. frugilegus*) is a dark and gloomy bird ; partial to church-towers and church-yards ; but not so much so as the jackdaw. It is a useful adjunct to the farmer ; and has its analogue in the country rector ; who like the rook is by some accused of taking more than his tythe dues of the farmer's corn ; which some say he should not touch. For our part we like the cawing of rooks in its proper place. A rookery is often thought as necessary to a squire's domain as a parsonage ; both being in the interests of agriculture. Too many rooks are a nuisance ; and so a rook-pie is allowable in all overstocked rookeries. This typifies the recent onslaught on the Irish Church. The poor Irish rooks are being routed out with unrelenting venom.

The jackdaw (*C. monedula*) shows all the prattling, noisy habits of its allies the crows. It has extraordinary powers of learning to speak, and the avaricious properties of its kindred.

The jackdaw from its devotion to ecclesiastical buildings, is a type of the noisy advocate of the rights of the church.

“A man may cry Church! Church! at every word,
Without more piety than other people;
A daw's not reckoned a religious bird,
Because he keeps on cawing from the steeple.”

These birds are little molested in the vicinity of ecclesiastical buildings, on account of their sacred character and lofty height, which few climbers can reach.

The magpie (*C. pica*, Linn.) is the most ingenious, elegant and clever of its family; and in volubility also surpasses the rest. It is a type of the orator and speech-maker. As speaking more than any of the small birds, it may be called their representative.—It has many analogues in Parliament.

The magpie is one of the most curious of nest-builders; for it twists thorns into the form of a mat or roof, for the protection of its eggs and young.

The plumage of the jay (*C. glandarius*, Linn.), very chaste and harmonious in colouring, is suggestive of a pretty costume suitable to a lady. The black wings and tail, and line along the cheek, answer to the skirt and black velvet neck-ribbon; while the light grey, spotted head-dress, resembles a white net over black hair.

In disposition the jay is a thief, but shows the intelligence common to its class; and as it can be taught to speak it is an interesting bird to keep in a cage. It breeds in forests, and is very destructive to the eggs of small birds. Being of a combative spirit they are attracted to traps, by an imitation of the cry of their enemy the owl, which they wish to attack.

If the magpie illustrates the orator of the upper class, the jay does the radical of the middle class, who is willing to sap the root, of what affords the greatest pleasure and benefit to man.

The chough (*Pyrrhocorax graculus*) is now extirpated in many of the old localities in Britain, where it formerly abounded. These places are strange to say, the same as those where the earlier British races have remained little disturbed; such as Wales, Cornwall, the Isle of Man and the West of Ireland. But now like these races, the bird is becoming less conspicuous.

The chough is a red-billed, red-footed bird with black feathers; reminding us of some of the Welsh and Cornish complexions, which are very pink, and accompanied by black hair. They form a considerable contrast to the persons with black hair and yellow skins; whom we have formerly compared with the blackbird.

The lyre-bird (*Menura superba*, Davis) is one of the most lovely and curious of the singular birds of Australia. Its tail

resembles a lyre of the true classic type ; showing that form in Nature, is repeated in Art. Its peculiar, unpleasant song is suitable music for the savages of Australia ; to whom the bulbul of Syria, or the nightingale of Europe, would be no more pleasing than the rudest music, afforded by birds of the harshest tone of voice. The lyre of this island continent, is therefore not that of Apollo !

The umbrella-bird (*Cephalopterus ornatus*) displays an extraordinary crest in the form of a large projecting hood over its head ; as well as a plume in front of long dark feathers. From its aspect it might appropriately attend funerals. The plumage of its head and neck, reminds us of a black cloak. So dark and gloomy a bird in an attire resembling a mourner, as an inhabitant of the fertile regions of the Amazons, is in harmony with a soil teeming with organisms in *decay* and *birth* ; whose very aspect, throws around the traveller a gloomy impression.

The waxwing (*Bombycilla garrula*) is a bird of bright and harmonious plumage, with a flowing beard and a fine crest. It is ornamented with little wax-like feathers, which tip some of the quills of its wings. It is gregarious in winter, and occasionally visits Britain in flocks, during the storms which accompany this season ; but chooses the colder portions of Finland and Lapland as its breeding resort. It is perhaps the most beautiful of the small birds that visit our Island, but is distinguished by a harsh cry, and dirty habits. In Lapland it is much esteemed for the table, where it supplies the place of the *bec-a-fico* and the ortolan.

When we see the fairy form of the waxwing, during the chilly, dusky days, we think that other lands are worse than ours, and that the little bird feels glad to come among us and share our seeds and berries.—If our country is cold, theirs is colder still.

Birds of Paradise (*Paradisæa*) were long misunderstood. They were supposed to inhabit the air and not touch the earth, and feed on the dews of heaven, and never needing to perch had no feet. As they were believed to have so little connexion with Earth, they were called birds of Paradise ; but the knowledge of their habits was as confused, vague and uncertain, as that of this unexplored country. Now they are known to possess feet, and to live on fruits and insects like other birds.

The land in which they dwell, although a *Paradise of Birds*, of reptiles, of insects and of plants ; is not a PARADISE OF MAN. He imitates the low forms of life in the abode of these birds, in the isles of Sunda ; and especially in New Guinea ; where pestilence mocks at the life of man.

The emerald bird of Paradise (*Paradisæa apoda*, Linn.) is a splendid species; and as it flies with the sun shining on it, glances like a meteor (Lesson) dazzling the view; for its plumage is so soft, that it appears like a golden train. It is most elegant in its habits, and apparently admires itself as much as it is admired by men. Good plumage in birds, is an indication of physical vigour and lively spirits attendant thereon. The life and cheerfulness of Man, are generally greatly dependent on the state of his health, for the mental and physical condition are usually found in harmony.

The voices of these birds are harsh and unpleasant to the ear, which somewhat lessens their attractive qualities. Their habits are arboreal; and they seldom perch on the ground except to quench their thirst. The birds are polygamous like the unchaste natives of these isles; which shows them to be the type of the inhabitants of that sensual paradise, to which the followers of Mohammed expect to retire.

The humming-birds (*Trochilidæ*) are the representatives in the Western Hemisphere of the sun-birds of the East, and are smaller, more delicate and brilliantly decorated if possible than the Nectariniadæ; those creatures of sun, who "suck the honeyed flowers." They are tropical birds, far too brilliant to be characteristic of cold climates, or to bask in a winter sun. These are allied to the warblers in their method of breeding, as well as in shape. They shine like brilliant gems amid the gorgeous fauna of warm and tropical America. Their plumage sometimes exceeds in lustre any human productions, for it surpasses in dazzling refulgence, plates of burnished metal.

It is curious to observe insects and birds, decorated with scales which might be mistaken for polished metal, did we not know by chemical tests that it is mere unsubstantial tinsel, the glitter of gold, of copper and of gems without anything of their substance. We likewise see that the most powerful and intelligent birds, and the most wonderful insects in their habits and their works, lack this false glitter, which often appears to hide what would be otherwise plain, of insignificant size, and of puny and feeble force.—A large beetle in our cabinet, weighs eight times as much as a small humming bird.

Poised on the wing, they make a reverberating sound as they sustain themselves; reminding us of bees, or of the little British moth (*Macroglossa stellatarum*) which goes by their name, and is all we in our climate know of the humming bird. Except bats and fish, they are the smallest of the vertebrate animals; and so much less than most birds, that our wonder is excited, in beholding them perform all the functions of pairing, nest-building and rearing their minute young; as perfectly as the largest

species. The humming-birds are less intelligent than many other divisions of birds, but some are sufficiently so to make ingenious nests. They show a courage in defending their young and eggs worthy of the largest birds.

The bird-catcher spider (*Mygale*) attacks these little gems and their infant progeny, sucks their blood, and leaves but glittering dust. Which reminds us of a lovely flower crushed by a Giant's thumb; or a bright "child of Eve" in the grasp of grim Satan. Their sportive motions and habits are significant of pleasure, and suitable to the perpetual summer which commonly smiles on their lives. But even they, have their battles with each other; for the *hot* atmosphere they breathe will sometimes provoke ire. They are especially characteristic of the fauna of Mexico and Peru; and delighting in the bright days of that climate, and the beams of the great luminary; they may be compared with the aborigines of those countries, decked in a gorgeous attire of gold and feathers, who WORSHIPED THE SUN.

The woodpeckers are a useful class of birds, as they are mostly insectivorous. They are oftener heard than seen, for the tapping sound they make on hollow trees, to dislodge the insects therein, echoes through the woods. The green (*Picus viridis*) and spotted woodpeckers (*P. major*) are those species most familiar in Britain. They are true foresters, like the woodsmen whose business is to destroy insects injurious to the trees.

The plumage of the different species of woodpeckers varies much; some being very bright and gaudy, and others of dusky tints, especially the females. The costumes of the keepers of the forests are very different, some being obliged to wear a gay livery; while others adopt a plain attire. However brightly the men may be clothed, their wives are mostly dressed in dingy garments.

Foresters and woodpeckers are both necessary to the well-being of society, and the protection of valuable timber. The former may injure the trees in spring, by tapping them for their luscious juice, or by breaking off their branches for firewood; while the latter may in search of insects, sometimes peck holes in sound trees, or enlarge those in the partially decayed.

The wryneck (*Yunx torquilla*, Linn.) is a summer visitor from the north of Africa. It has been called "the cuckoo's mate," for it arrives a week or two earlier than that bird from the same southern region. The plumage is variegated in a remarkable manner, with several shades of grey, brown and buff. It resembles the woodpecker in food and habits, but its more dusky colour and shy manners, cause it to be less conspicuous.

Although so plain in colour, its markings are exceedingly chaste, and we admire it more than we do some other species of brilliant hue.

We may compare this bird with the consumptive but graceful cottager in plain attire, who is more pleasing than many a gaudily-dressed girl. When winter comes this chaste daughter of the forest dies, she being one of those "sweet flowers" that expire every year, unless like the birds they can pass the winter in the south.

The hoopoe (*Upupa epops*, Linn.) whose various notes resemble its names in sound, is adorned with a beautiful crest; but it is a rare visitor to our land, and does not often remain to breed. Its graceful motions and useful habits in destroying many larvæ of insects that infest timber trees, render its greater frequency desirable. It has a habit of throwing up its food in the air and catching it, like one engaged in sport. The crest it wears, rare among the soft-billed birds, reminds us of the attire of the dressed up clown, who on a holiday trespassing in a game preserve, acts "the king of the forest," but who endeavours to escape or hide himself, whenever the true Lords of the forest or their attorneys appear.—The hoopoe flies *crestfallen* before the hawks and the crows.

The nuthatch (*Sitta europæ*) possesses extraordinary strength in its bill for so small a bird, and still more dexterity in its use. It places the nuts in a groove of the bark of a tree, and continues to hammer at them until they are split; when it eats the kernels and rejects the shells. It also collects the insects it meets with as it climbs among the trees. Its back is grey and its belly somewhat yellow, reminding us of the colours worn by a Quaker; like whom also it has a habit of shaking its head. The "Friends," like this bird are distinguished for perseverance, and for accomplishing much with little means; they also know the difference between chaff and grain.

The cuckoo (*Cuculus canorus*, Linn.) is said by Shakspear to "mock married men." These words of the great dramatist, are capable of bearing two interpretations, equally illustrative of the habits of the bird. *Firstly* the cuckoo's custom of having its eggs hatched by other species, typifies the offspring of one man brought up by another couple; who are thus "mocked" by him. *Secondly* the female cuckoo, is in the breeding season followed by *several males*;—polyandrous conduct, like that of the inhabitants of Thibet, in ridicule of the exclusive sexual relation.

The cuckoo has a bad disposition; it entirely neglects incubation. It is generally believed to be nearly, if not quite indifferent

to its offspring when hatched; although instances have been observed of the old bird feeding its young. It is dirty and awkward, and has a stubborn, greedy, violent, and as we have remarked a licentious character. All these peculiarities which we have specified as characteristic of the female cuckoo, are observable in its lady-prototype.

The cuckoo lays its eggs in the nests of from fifty to sixty species of various Genera; shrikes, thrushes, warblers, larks, pipits, buntings and finches.

The "colorization theory" with which the name of M. Baldamus is associated, if insufficiently proved, is at least curious; but thirty observations of the author tend to confirm it. His researches lead him to think that the colour of the egg of the cuckoo which varies considerably, usually approximates to that of the eggs of the species in whose nest it is found. If this be a tree pipit the eggs of which are most commonly reddish, the cuckoo's egg assumes a tinge of that colour. When in the nest of a reed or sedge warbler, whose eggs are green, that colour is likewise found in the cuckoo's egg.

The "colorization theory" supposes that an impression is made on the *sensorium* of the bird, by a view of the tint of the eggs in the foster parent's nest, which influences the colour of the expectant cuckoo's egg, without however destroying its individuality of markings. This is but a new application of an ancient belief of "Female susceptibility," on which Jacob acted in his dealings with Laban's cattle.

The cuckoo visits the hedge-sparrow's nest in the low Hawthorn; a type of domestic happiness disturbed in the cottage, by the bastard of higher origin, introduced into a humble family; for he like the ferocious young cuckoo, may drive his foster brothers and sisters from home.

The roller (*Coracias garrula*, Linn.) is a showily coloured bird, but possesses an ugly beak, a harsh voice and a habit of rolling its head. It reminds us of a gaudily dressed woman whose head is seldom still, with a coarse mouth, who produces a disagreeable impression when she opens it.

The roller is not nice as a cage bird, and is difficult to tame and awkward on the perch, and would be little noticed had not its feathers a bright metallic lustre. This style of woman, were it not for her "showy dress," would take a much lower standing.

The bee-eater (*Merops apiaster*, Linn.) vies in colour with the clearest and brightest skies of blue and yellow, such as are seldom seen in our land. These birds are not often killed in Britain, but appear to belong to a clime where they can reflect the tints of the atmosphere. They ornament the fauna of the

south of Europe, which in summer enjoys a semi-tropical climate. The bee-eater abounds in the Greek Archipelago, and is caught by the Cretan boys as it flies past, with a hook baited with a lively insect ; for its food is similar to that of the fly-catcher. Its brilliant plumage is accompanied by little merit as a songster, and is emblematic of the gaudy tints of dress, so much in vogue in Algeria,—the home of this species.

The workman of northern Europe is not surrounded by brilliant tints in natural objects, to provoke emulation in the colouring of his manufactures ; and thus sober hues in dress and ornament have generally prevailed.

The kingfisher (*Alcedo ispida*, Linn.), is an exception to the common order, by which the tints of the birds of Britain, correspond with the dull hues of the skies ; but which yet possess a varied beauty and grandeur, not to be excelled. No common bird of Britain is so brightly coloured as the kingfisher ; for green, blue, buff, orange and bright red, unite in adorning this gorgeous species. But its body is clumsy, its bill heavy, and its motions awkward ; yet its flight is rapid, and it utters a peculiar cry as it darts into the air. It sits quietly on the branches of the trees overhanging the water, from whence to pounce down upon those minute creatures of the finny race, that approach the surface. It places its eggs on their bones, usually in a hole dug by its own efforts, in a bank overhanging a stream. The first week in April is called the "Halcyon days," for then the kingfisher begins to sit. The storms which accompanied the equinox have ceased, and tired Æolus for a moment holds his breath. The bird's habit of breeding just at the commencement of pleasant spring weather, has caused it to be viewed almost with superstitious feelings. Winged fable has given it control over the air ; and it has been stuffed and suspended in cottages as a weathercock. When compared with other birds that live on fish, its brilliant hues give it a regal pre-eminence ; but its small size renders it one of the most insignificant of fishing birds. Those who are regal and pompous merely in dress, excite little respect ; they are like stage kings or queens, having as little power as the King that "Drinks" on Twelfth night.

CHAPTER IX.

THE POETRY OF BIRD LIFE.—*Continued.*

PARROTS—MACAWS—COCKATOOS—TOUCANS—SWALLOWS—DOVES—PHEASANTS
 —PARTRIDGES—PEACOCK—COCK—OSTRICH-FAMILY—DODO—QUAIL—
 BRUSH TURKEY—PLOVERS—CRANE—BUSTARD—HERONS—STORK—SPOON-
 BILL—IBIS—WOODCOCK—ADJUTANT—FLAMINGO—BALÆNICEPS—RUFF—
 GALLINULES—GREBES—SWANS—GEESE—DUCKS—DIVER—GUILLEMOT—
 PELICANIDÆ—TERNs—GULLS—PETRELS—PENGUINS.

OF all classes of animals that make their voices heard in the forests of the tropics, those of the parrot tribe are the most disagreeable. The roar of the lion, tiger or jaguar, is individually more terrible than the cry of these birds, and is associated with shedding of blood ; but it is usually solitary and not like that of the parrot, echoed by a host of comrades, whose united clamours,

Assail the ramparts of our ears,
 And take the drums by storm.

The nerves of the traveller on the Amazons, are more shaken by such an aural assault, than by the yell of the wildest beast.

The analogue of these birds is to be found in the prating, prattling, never-tongue-tied class of persons, who commonly have noses like parrots' beaks, and goggle eyes to match. These when at all numerous, are more formidable to persons of delicate nerves than the tigerish bull-dog class of men, who are usually so much dreaded and avoided by society. The parrot class of men on the contrary, although so disagreeable to some persons, are commonly protected and petted. The voices of these individuals, like those of parrots, are generally sharp and harsh ; yet they find admirers, nay even worshippers, who make parties to hear them talk ; but they are often malicious, and can use the foulest language, instead of the flattering phrases they sometimes express.

Parrots, like human imitators, display different degrees of cleverness in their performances. The men with whom they are compared, are accused of repeating words and sentences,

without comprehending their meaning. The parrot is not a creature of Europe, and the nations of whom it is a type, are not European. The natives of that continent are not "parrot-like" in their method of learning; but the countries that produce parrots, nourish also nations of imitative tendencies, who in a greater or less degree adopt the manners and institutions of their superiors; yet *comprehend* them but little.

Parrots are worth examining in detail, as affording a striking analogy with classes and nations amongst men. They are wonderful climbers, having powerful feet and beaks, which are almost as hard as the hornbill's. They greatly use their beaks in progression; for seizing on the branches of trees, they can raise themselves into a higher position. This habit is illustrated by the manner in which some persons, rely more on the *use of the mouth* to assist them in "moving in society," than upon manual labour. Parrots live to a great age, and in style of features, remind us of those we occasionally see amongst ourselves. Some species are apparently good-natured and affectionate towards men; while others preserve a cool indifference, which is often most markedly expressed in their eyes, which sometimes indicate a high degree of impudence and selfishness. Some of the smaller parrots are gentle and affectionate to one another; almost equalling the dove in this respect. The whole genus show great affection for their young, and carefully choose their breeding-places.

Monkeys and parrots show much analogy in character and habits; they both possess extraordinary powers of imitation, which they exercise in copying man and his peculiarities. Monkeys "take off" his gestures, and parrots his speech. Both are excellent climbers and are mostly arboreal in habits. In their native forests, parrots are exclusively vegetarian; but in confinement they show their flexibility of habit, in eating readily almost everything that is set before them. They accommodate themselves most thoroughly to the diet of artificial life, and appear to enjoy such luxuries as pastry and highly-flavoured viands, and even learn to relish wine to excess.

"Parrot-like" nations more readily imitate the vices than the virtues of their superiors. Parrots are pre-eminently social; another resemblance to imitative men, whose predominating sympathies, induce them to desire constant society; which birds, quadrupeds and men, that possess more *individuality*, do not so much seek for.

The most remarkable peculiarity in parrots, consists in their admirable power of imitating the speech of man; which is not however given to all species; or even to all individuals of a species in the same proportion. We have an instance in the

pathetic story related in Humboldt's "Views of Nature," of how the language of the unfortunate tribe of Atures was preserved by an old parrot, after the tribe had for ever perished. An instance of what an humble imitator; an eaves-dropper; a creature insignificant in itself, may be the means of doing. A nobler creature might be too unbending to stoop to this. Such was Boswell, who did for Johnson's memory, what the parrot of Atures did for its dead master;—IT PRESERVED HIS LANGUAGE. The species tamed by Johnson, in that idiom Dog-Latin, is the *Boswellia Parrotii* of Cànis.

Parrots of the most brilliant plumage, are often least gifted in the power of imitating speech. The most wonderful and intelligent birds also of other orders; whether as songsters or architects, are usually not brightly coloured. The sombre hues of the honey bee, the ant and the *Locusta migratoria*, that most destructive of insects; are themselves indicative of power. Their very dusky tints compounded of bright colours, typify combined forces, which are much the most powerful. The Bilious-Nervous temperament, accompanied as it is by so much of the colour brown, is that which indicates the greatest strength and activity in the higher animals.

The macaws are the largest, strongest and grandest in plumage of the genus, and have regal and pompous magnificence about them, worthy of the gorgeous courts of Mexico and Peru, as they were;—and of Brazil as it is. But they show less capacity for learning to speak, and are more satisfied with their own attainments, than the wiser, yet smaller parrots. They are ill-tempered, and bite sharply and severely when provoked. The red and blue macaw (*Psittacus macao*) is the largest of the class, and can speak better than any of the family; but it is dirty in its habits. It is a type of the Brazilians, who, with all their gorgeous style of living, show much that is unclean and offensive.

The macaws of St. Domingo are as inferior birds to the green macaws (*P. militaris*), as was, and is the government and national character of the people of that island, to those of Mexico and Peru. This is a magnificent species, and worthy to be the type of those great but faded monarchies. The land is still green, and there is yet hope that good government may accomplish much. These peoples are now in their moulting state; but when their new plumes grow, they may yet shine in their sunny lands again.

The Illinois parrot (*P. pertinax*), a common bird in captivity in Europe, builds in the termite hills of Guiana and Brazil. It is affectionate and intelligent, but its talking powers are very insignificant; yet its plumage is extremely beautiful. These

birds congregate in flocks of several hundreds, and post two or three of their number as sentinels, to give notice of the approach of enemies. Similar habits are observable of monkeys;—and of Man in a savage and civilized state.

Parrots illustrate many classes and occupations. Thus there are “orators” among parrots, who like prating men of great speaking-power are certainly highly talented; yet such close imitators, and so much inclined to parody; that they may afford amusement, but can never inspire respect. They rank higher than buffoons; for their sentences are longer, and they rely less on what is noisy, than on what is pompous and long-winded. Instances of parrots repeating considerable passages, from the works of great authors illustrate this; as the parrot who repeats merely a few words, or imitates street-cries does the “Buffo.” The opportune manner in which it introduces sentences is sometimes very striking, accompanied perhaps by a guffaw, closely imitated from some silly fellow, who laughs loudest at his own jokes.

There are “parrot-like” lawyers, who are very clever. There are “parrot-like” clergymen, who read the service with no more feeling than these birds do, when they repeat The Lord’s Prayer or The Apostles’ Creed. A bird that could repeat “The Creed,” was bought for a hundred pieces of gold by a Cardinal; whose appreciation for its unfelt utterances, was doubtless founded on similar sentiments.

Parrots learn tunes which they can often whistle with correctness, but without feeling. A type of the harsh Old Maid who sings. Her voice is as much dreaded by the children in the nursery, as is the cry of the carrion crow among the chicks of the farm yard. The parrot,—her idol has closely imitated her voice and exceeded the model in asperity. The talking parrot is a favourite with the unreflecting and gullible portion of the public, who mistake its senseless utterances for humour or wit; as they also do the folly of Buffoons, and the blunders of noodles. Fools rate at a higher level than they deserve, the mere parrots of all professions, who are the most idle and useless of their craft, and yet the most noisy and voluble.

Cockatoos are an elegant stately class of birds, which have a genteel air about them; but yet among us are purely ornamental; for they show even less intelligence than parrots. They may utter a few words, which seldom go farther than their names; for they are more occupied in keeping their feathers in order; and putting on stately and lofty airs; than even in active mischief. They remind us of lazy but beautiful *blondes*, wholly given up to dress and contemplation of themselves; not being able to talk about anything else. Like

oriental beauties the cockatoos are mostly attired in white, but are yellow about the face and head. There are black cockatoos, which illustrate Melanic Sultanas of the Oriental isles; who are about as useful as their white allies.

The little parrakeets form a numerous division of graceful, charming birds; not to be excelled in beauty by any class kept in cages; and their dispositions are equally amiable; for they show a gentleness and sweet affection for each other, equal to the turtle doves. They may well be called "love birds," for they are what we *love* to contemplate, and may teach many of us lessons in conjugal or brotherly affection. They mourn the loss of their companions, and have been even known to die of grief; which we do not commend in them, or in those persons whose feelings are so intense as to wither at any shock of this kind. Yet a little more grief, like that displayed by the constant birds, at the loss of mates or relatives, would be pleasing even amongst Mankind.

The toucans (Rhamphastidæ) are relatively small birds, but have bills which approach in size those of the largest living species. Their wings and beaks are vividly coloured, and their markings remind us of the tattooing of savage nations; but the brilliant colouring of the bill is only retained during life. Like most nations who tattoo themselves much, they show pugnacious dispositions; savagely attack the young of other birds, and pierce the nests with their powerful beaks. Even those built of strong clay such as the *Synallaxis*, are destroyed by them, although safe against many marauding reptiles and birds, who are not so powerfully armed as the toucans. But in the dry season the clay nests of the rufous bee-eater, are sometimes impenetrable by this bird, which most cunningly waits until the rain softens it; when it proceeds to the "breach" and destruction of the tiny fortress.

Sir Robert Schomburgk mentions a tame toucan, which domineered over the fowls and even large four-footed beasts, on an estate in Guiana. It was allowed to feed itself first, and maintained order among the large and small creatures on the farm.

The upper mandible of the toucan, being so much larger than the lower, it is awkward in the use of its bill; being like the hoopoe obliged to throw its food up in the air, and catch it in its open mouth.

Bullies have their representatives in every order, and are generally awkward and coarse in their manners. Such have mostly large mouths or beaks; or large heads, with a body—like this bird's—comparatively small; a combination significant of great impudence and courage, when contrasted with position.

The swallow (*Hirundo rustica*, Linn.) is viewed from its first appearance in April, till its departure in autumn, with more pleasure than most birds. This pleasure is accompanied with a feeling which to the greedy and selfish would greatly enhance any psychological or æsthetic interest, the knowledge that it does not feed on grain, green peas or berries. Its food consists entirely of insects, which it catches on the wing. These are principally gnats and other minute Diptera: but often in



THE RED AND BLUE MACAW, PSITTACUS MACAO.

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flitting in the neighbourhood of hives it may capture the industrious bees.

The swallow like other migratory birds, visits in summer the land of its birth, and in winter the land of its adoption. They are a graceful tribe, and for such small creatures have marvellous power on the wing. They are ingenious nest-builders, for they plaster the mud on perpendicular walls, and with the aid of straw and roots, make so strong a dwelling, that were it

not pulled down by man, would usually last a good many years ; and it is accordingly inhabited by the bird for a succession of seasons. The swallow is awkward in its movements on the ground, but it clings gracefully to its nest, and on the wing it is at home. In its undulating flight it approaches very closely to objects ; but when we think it will dash itself against them, suddenly alters its course, and in a few seconds is far from danger. This rapid change of movement reminds us of that of a skilfully-managed yacht of the most approved construction ; whose proximity to the shore, causes us to fear for her safety ; yet she makes a sharp curve, and launching securely into deep water, makes a safe path for herself.

Swallows by their different movements, are supposed to prognosticate foul or fine weather. They haunt us in many dreams, in which we, in imagination floating on the air, visit many lands like these migratory birds, to be revived by change of scene ; for if we cannot like birds fly in person, we can in thought. Those who possess the power of dwelling in the happy days of youth, and in the likewise pleasant days of experience, when though the season is not so genial, yet hope makes it cheerful, never grow old :—Like the laurel they die green.

The goatsucker (*Caprimulgus europæus*, Linn.) is absurdly named ; for its structure would render it incapable of sucking a goat.* It is a beautifully marked bird, with a plumage shaded like the wryneck with buff and brown ; which may be compared with that of some owls, also nocturnal birds ; whose unobtrusive colouring renders them the better able to pursue their prey unobserved. Goatsuckers are stupid birds ; they make no nest, but merely lay their eggs in a depression on the ground among the ferns. They fly in a clumsy manner in search of the insects, which taken on the wing form their prey.

The swallows as day-flying species, may be compared with the falcons ; and the goatsuckers, birds of night, with the owls. Nocturnal species of animals, illustrate dark, gloomy influences, which pervade all Nature. It is only the greater workers that are then in repose, the lesser are not hushed to slumber ; but as eve opens, enter into busy activity. The earth is then peopled by moving creatures, when the motions which accompany daylight have ceased.

The passenger pigeon (*Columba migratoria*) is the most migratory and remarkable species of the genus, for it comes in count-

* This bird will sometimes perch on a sheep's back, probably like the starling to feed on the ticks and maggots which infest the animal. When seen clinging to the belly of the brute during the twilight, it might easily be supposed to be sucking, when it was in reality removing noxious pests : tradition has usually some foundation in fact.

less numbers, covering the ground, trees and bushes for many miles. The devastations they commit, are dreaded by the civilized man, when in their annual migrations, they approach his fields. Like the locusts they break the trees by the weight of their myriads. They strew the whole country for long distances with their dead bodies, unfledged birds, eggs and dung, which are largely devoured by birds of prey, pigs and dogs. The pigeons scatter themselves over the country to collect food, and have been known to leave their nests early in the morning; fly sixty miles to a place, where food was abundant, and return before noon.

These rapid movements of the bird remind us of the journeys of men of business, who *sleep* and *multiply* in Brighton (fifty miles from town); but who visit London daily to obtain their livelihood. The migrations of this species of pigeon in countless numbers, represent the emigrations of European nations towards the West. During the late war they fell victims to many enemies as they landed from the East, being sometimes almost as helpless as these pigeons in the vicinity of their foes. The bristly hogs typified "the railway contractors," and the birds of prey the "conscription crimps."

The inhabitants of Kentucky use burning sulphur, guns, clubs and long poles to drive away these birds, but only with partial success. It was somewhat wonderful, that the dread of sulphur and gunpowder, did not deter human emigrants from rushing to the United States at the time of the late rebellion.

The turtle-dove (*C. turtur*, Linn.) is prettily and delicately mottled, if it does not display the brilliant plumage of some exotic species. As the turtle cannot bear the cold of our climate, it visits us only during the mild season, and its pleasant note is a true indication that summer is near. "The winter is passed, the rain is over and gone; the time of the singing of birds is come, the voice of the turtle is heard in our land." Then is the happy season when all "nature is married."

The ring-dove (*C. palumbus*, Linn.) is the most common in Great Britain, and is a most attractive bird, from its sweet note, and beautiful though stout form. Its hue is modest, and were it not so destructive to vegetation, it would be more generally liked and less persecuted. Its ring which only goes half-way round the neck, is like the ring of betrothal, not the ring of marriage. The collared turtle-dove (*Turtur risorius*) on the contrary, has a plain thin mark round its neck like a wedding ring. Betrothal rings have a broad top, and are often "half hoops." This pigeon like the passenger species, flies far to obtain food for its young;—a tender solicitude for offspring, which in man is the accompaniment of constancy.

The pheasant (*Phasianus colchicus*) stands at the head of British game birds; with all the grace of an exquisite form and shape, and all the gorgeousness of regal state. It represents a European sovereign; as the peacock, and gold and silver pheasants, whose plumage is more brilliant, illustrate the more gaudy attire of Oriental princes. The pheasant as a native of the East, represents the Oriental origin of many of the brilliant ornaments of European kings; yet it and they, have been long naturalized in the lands of the West.

The pheasant, like many other game birds is polygamous; a peculiarity not uncommon amongst those men exclusively devoted to sports and games, although it may not openly receive this name. In mediæval times our sporting characters dressed in brilliant attire; which we may compare with that of the cock pheasant; but now "Young sporting England," is clothed in sober hues, like the hen or young pheasant.

The partridge (*Perdix cinereus*, Linn.) is, compared with the noble, arboreal pheasant, an humble insignificant creature, in colour as in habits; for it seldom mounts trees or flies high. When it does take wing, it makes a great noise;—a striking contrast to the flight of many birds. If clumsy flyers, they are good runners. They are monogamous, and have a modest, innocent expression, unlike that of the licentious cock pheasant. Being principally graminivorous, they consume much of the farmer's crops, which is condoned on account of their great value as game.

It is difficult to induce them to alter their habits, like their analogues the rustic squires, who are not given to flying high or far. Pheasants are often bred in towns, and are carried out into the country for sporting purposes; but the old-fashioned country squire and partridge, do not care to breed in the city. They are noisy, but not inclined to showy display. Some dispute the utility of the modestly attired partridge and his master the squire, as obstructive to agriculture in eating up the produce of the land. These forget that the landlord as well as the birds of heaven, are entitled to subsist on the fruits of the earth.

The English partridge is a nice juicy little bird, but not so large and strong as the red-legged species (*P. rubra*, Briss.); when these are brought in contact, the weaker bird gives way. This has been the case in more than one part of England. The Normans in like manner subdued the Saxons, and in some localities became the predominating element in the population.

The golden and silver pheasants (*Phasianus pictus* and *P. nycthemerus*) are among the most beautiful of their tribe, and shine as they fly, in their native woods like the Sun and the Moon.

The golden pheasant,—a native of Japan, reminds us by its

bright plumage of the Japanese Daimios, whose social position and splendid style of living, command so much admiration. The silver pheasant we think typical of the Mandarins of the Celestial empire.

These pheasants fade into insignificance in sight of that comet amongst the birds, the peacock (*Pavo cristatus*) whose main glory consists in its tail. It is nearly unexampled in variety of tint for so large a bird; and its hues are distributed in a most attractive manner, so that it forms when in good plumage, with its tail spread towards the bright sunset, one of the finest objects on which the lover of the beautiful can feast his eyes.

This bird has long been thought so conscious of its personal importance, as to have become the representative of pride in human character. For like a man in whom *pride predominates*, it throws its head back as it walks;—the natural-language of large "Self-Esteem." Its fine crest is then erect; but when terrified it lowers its crest and tail, and retires "in all the consciousness of defeat." It is interesting to watch a pair of bright peacocks, in combat for a dull peahen; like two Oriental potentates devoted to a Venus of the East. They approach each other with crests erect, and tails expanded, in a slow and dignified manner, watched perhaps by the barn-door fowls with astonishment from a distance. They begin their fight by pecking at each other's tails, which are typified by the border-lands of Indian Sultans. When the conquering prince has shorn his enemy of much fair territory on the outskirts of his dominions, he attacks his capital. The victorious peacock in like manner, having plucked the plumes and tail of his antagonist, flies at his head. A stage in the conflict, both with princes and birds, followed by the retreat of the weaker party. Neither Indian princes nor peacocks, have a *foundation* of much courage beneath their glittering array.

The peacock throne of Shah Jehan, came behind that monarch, like the tail of this creature which it imitated. The train of the peacock following the body, has doubtless suggested much of the pomp, the "*appanage* of royalty." The pride of Oriental sovereignty is like that of a gallinaceous bird, such as this. It has little of the *hard-courage* of the hawk or the owl, which conquers birds of larger size than itself. The peacock in this respect is inferior even to the turkey of America (*Meleagris gallipavo*), whose degree of courage in attack and defence, reminds us of the Mexican princes.

Montezuma the greatest aboriginal potentate of the New world, was illustrated by the ocellated turkey (*M. ocellatus*) which has some of the gorgeousness of the peacock of the East, just as Montezuma had of the great Oriental princes. He suc-

cumbed after a faint show of resistance to the Spaniards, as these turkeys do to the larger birds of prey.

The common domestic cock (*Gallus domesticus*) and its numerous varieties, like all other creatures that have been thoroughly tamed by man, show very great variation in size, form, colour and markings. Cocks and hens, like horses, dogs, cats and sheep, show an analogy to each other, as regards temperament and complexion. Red fowls most approach the sanguineous temperament; they are the most courageous and the best for gaming; and light-coloured fowls, including the brownish, reddish and speckled, are the most prolific, and perhaps the best for the table; being milder both living and dead. Red-haired men are commonly hot-tempered and quarrelsome, and have often a great deal of "game" in them. Black breeds of fowls are often preferred to other varieties, on account of the large size, number, and superior qualities of their eggs. The secretions such as milk, of black-haired or black-skinned animals, are rich. But fowls and most other animals which are melanic, are more susceptible of cold than red or light-coloured breeds.

There are many intermediate varieties amongst these birds, some being curly and rough in the feathers and others smooth; analogous to the hair of different human races.

The ostrich (*Struthio camelus*) vastly exceeds any other bird in size, now inhabiting our globe. It is a native of Africa, the country that produces the largest known quadrupeds, and which is thus made the metropolis of animal life. It has been compared with the camel as inhabiting the desert, as having a long neck and legs, and in being able to pass a longer time without drinking than most other birds; and it is the only species that has been hitherto used for portage.

The ostrich has little general intelligence, and the Arabs even consider it proverbial for stupidity. It is variously described as "a good" or "the worst of parents;" but the truth may doubtless lie between these extreme accounts. The ostrich in Scripture, is said to "leave her eggs in the earth," and to be "hardened against her young ones." This indifference is probably only comparative when contrasted with the devoted affection manifested by other species, who sit more constantly on their eggs or young. The ostrich leaves her eggs when the hot sun renders her presence unnecessary for warmth. She evidently takes as little care of them as is consistent with their preservation at all, and therefore Luther was just in his application of the Scriptural illustration in Job. xxxix., to the negligent parent of his own time.

The Rheas are the ostriches of South America, but smaller and more insignificant than those of Africa; yet they are fine birds and by far the largest on the American continent. Like the "camel bird," they are very swift of foot, and tax the speed of the best horses of the country, and like it are often accused of deserting their eggs. They lay them at considerable intervals, so that they cannot all be hatched at once. Each hen bird does not hatch her own eggs, and they are supposed to sit by turns on the common lot; but the male has often charge of the nest. It is probable that the last eggs laid, form the first food for the newly-hatched birds. Bad mothers among ourselves leave their children more than they ought to their Father's care; who instead of being the master and protector of all, is made to perform DRYLY the office of a nurse.

The cassowary (*Casuarus galeatus*) a swift and powerful bird allied to the ostrich, inhabits the Sunda islands. It is becoming scarce from being often wantonly killed, for its feathers are not valuable for ornamental purposes, like those of that bird. At a distance they look like hair, yet on examination are seen to possess the character of those of birds. The bird fauna of these islands "is less vigorous" than that of South America. The cassowary is weaker than the Rhea, but it is stronger than the emeu (*Dromaius Novæ Hollandiæ*) the great bird of Australia, which has the poorest fauna and flora of any great country, not within the arctic circle. The human aborigines are *lower* in the scale of Morals and Intellectual capacity, than those of any part of the world of Equal extent.

A very large bird (*Casuarus australis*) the second largest living, has been lately found in Australia: it is a type of the savage Bushrangers,—“Monsters of Iniquity.”

The kiwa (*Apteryx Mantellii*) is one of the last of a family of Struthionidous birds which supplied the place of large mammals in the island of New Zealand. The love of this bird's feathers and juicy carcase, have led to its becoming nearly extinct. It is we fear a type of the Maori population, who seem destined to disappear before more powerful emigrants. As they did to the great birds of that island, so will be done to them, by the more powerful Anglo-Saxon race. The kiwa is a nocturnal bird of heavy, stupid aspect, that burrows in the ground. A type of the degraded Maoris, as compared with the more civilized Malays, of the same division of the human race. They have been in as great ignorance of what was passing in the world, as nocturnal birds are of daylight movements.

The mooruk (*Casuarus Bennetti*) of New Britain, is one of the most curious of its family, exceeding in wildness of aspect those of others of its class. Its long, straight, shaggy, black,

hair-like feathers are decorated with brilliant colours. It reminds us of the dark savage men of its home ; who paint devices of bright tints on their bodies.

The dodo (*Ditus ineptus*), an inhabitant of the Mauritius, Bourbon, and perhaps some other adjacent islets ; to the great grief of men of science has been long extinct. Its shape was quite unlike that of any other bird, for its little wings, could never have admitted of flight, and its short legs must have rendered it a poor runner ; and as an easy prey to man and animals it was soon extirpated. It was described as fat and gross in flesh, and of a dull melancholy aspect.

Let us endeavour to recal for a moment, the days when the dodo reigned the principal animal of the Island of Mauritius. The lovely Isle was richly wooded, well watered and very fertile. The scene of the tale of Paul and Virginia, has thrown an air of romance around its shores. In the days of the dodo's reign ; it was uninhabited by Man ; and his first settlers CONQUERED ITS KINGDOM. It is now occupied by a lively and industrious population, who have rendered it one of the most productive spots on Earth, for the valleys produce abundance of sugar canes, yams, manioc and maize. Various islands of the ocean ruled by wingless birds, have undergone similar changes. Where are now the moa of New Zealand ; the epyornis of Madagascar ; the great auk of Iceland ? Dead behind the march of man ! FOR EVER !! In like manner, His savage races perish before the advance of the civilized. The Age of great reptiles is passed or is passing ; the Age of great quadrupeds and the Age of great birds ; but the AGE OF MAN in the plenitude of power is COMING.

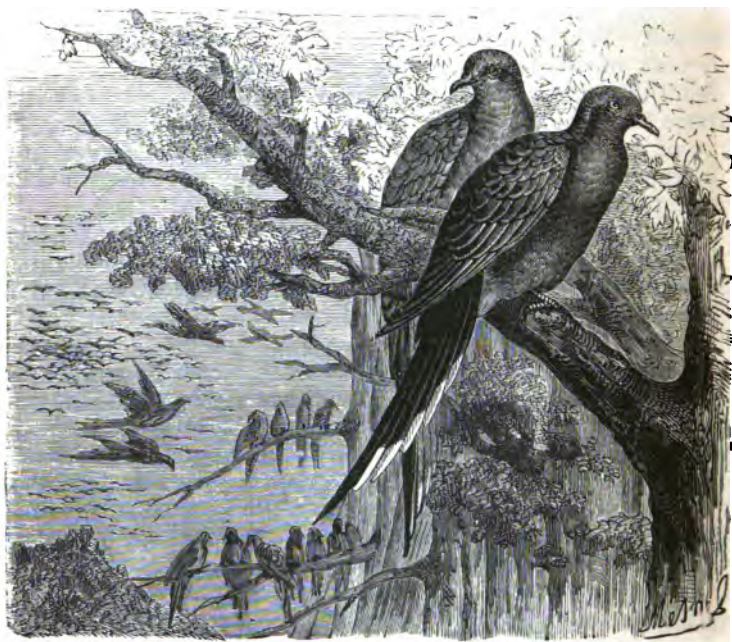
From the few relics of the moa and the dodo that we have, Professor Owen has built up perfect skeletons, which give a vivid idea of them ; so that the naturalist when wearied by anatomical details, may dream of extinct birds.

The grouse (*Tetrao*) are more beautiful than partridges, and more hardy than pheasants. They have the independent spirit of the inhabitants of a wild mountain forest, or a free and open moor. The natives of high-lands are commonly more addicted to the study of nature and attached to their institutions, than those of low-lands. In this they resemble the mountain grouse, so difficult to tame. The lustful quails care not for the stalks of heather gathered from the mountain sides ; but for the rank luxuriant produce of the plains, that can flourish best where pestilence abounds. The quails remind us of the voluptuous and degenerate inhabitants of many cities and low marshy lands, who lack the high qualities so common to mountaineers.



WHITE SPOONBILL, PLATALEA LEUCORODIA.

Page 243.



PASSENGER PIGEONS, COLUMBA MIGRATORIA.

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The brush turkey (*Talegalla Lathamii*, Gould) of Australia, is a small species compared with the bustards and the turkeys of America, and is like them typical of the Australian race, so degenerate compared with others.

The talegalla has an extraordinary custom of gathering together a large heap of vegetable *débris*, to form a sort of hot-bed on which the eggs are laid. The heat from the decaying vegetable matter, is quite sufficient to hatch them without aid from the parent bird; thus displaying great analogy to the method in which reptiles are hatched. A type of the "reptile" habits of the Blacks of Australia, who like this bird take little care of their young.

The long-legged plover, or black-winged stilt (*Himantopus melanopterus*), exceeds all birds in the proportionate length of its legs. They are of great importance to a bird that inhabits sandy plains, for they enable it to view the surrounding country for some distance in search of prey, or to wade through many a brook without wetting its feathers. These birds have been compared with the inhabitants of plains that walk on stilts; who like this plover would see farther than their neighbours.

The plovers, the woodcocks and the snipes are amongst the silliest of land birds. The dottrel is the most foolish of the waders, for it runs into danger that almost every other species would avoid. The plover genus typify the least acute of the Saxon population of these islands, who with *great folly* have no FEAR.

The crane (*Grus cinereus*) begins to breed in Sweden before the winter is over, and usually in remote localities, where naturalists have great difficulty in visiting the nests: hence for a long time its nidification was almost unknown to them. It is a splendid species, the tallest of the land birds of Britain, but it is not easy to observe it in a wild state on account of its shyness.

It reminds us of a lady of retiring manners, dressed in grey of a rich bluish cast, with a black silk cloak, her head being ornamented with long plumes. One species of crane is in France called the "*demoiselle*" (*G. virgo*), from the extremely delicate colours of its plumage which might suit a virgin.

The bustard from its size and height, could look down on the smaller land birds of Europe, like the great tenants of the soil on the yeomanry. The crane stands at the head of the Wading birds of Europe, and is a type of "the tenants of the crown," who manage the river fisheries. They are not usually so detrimental to the supply of fish, as the smaller tenants; typified by the heron.

The common heron (*Ardea cinerea*) is still preserved a deni-

zen of rivers and marshes, by those proprietors who wish to maintain the balance in nature. It is a noble bird, both on the wing, on land, and in water. It is very destructive to the fish of our streams, but being omnivorous it may also kill and eat many of their enemies, such as frogs, toads, small animals and birds. The heron is not very injurious on the great streams, as it feeds principally upon fish of a good size, in which it resembles the simple country angler; who like the bird is becoming more rare. The heron is as different in its mode of seizing prey from the gobbling duck genus, as is the angler, from the fisher who uses nets, which capture the fish large and small, to the great injury of the fishery.

The great and little egrets (*A. egretta* and *A. garzetta*, Linn.) are magnificent white species of the heron genus, whose plumes have adorned beauty from mediæval times to our own. The desire of gallant cavaliers to gratify ladies with ornaments for dress, doubtless led to the extirpation in some countries of these lovely birds;—ONE BEAUTY FADING BEFORE ANOTHER.

The bittern (*A. stellaris*, Linn.) "in the good old times," when corn-fields were marshes, and market gardens yielded only the bulrush and the sedge, often uttered its wild peculiar note in the Eastern counties. But now the bird is rare, a chance visitor from Holland or the north of Europe. When "the bittern possessed the land" it was laid waste, for this bird cannot exist in the midst of civilization: yet when we see it in the midst of woe, and hear its wail among ruins, we contrast its cry with that of the sweet warblers, that enliven the pleasant garden. The bittern's melancholy cry does not cheer us, but it tells of the rise and fall of cities and empires; and of the wail of those led into slavery, and thus teaches us a lesson that none of the song-birds can do; although their melody may carry our ears captive the whole summer; for they speak in simple accents of bright days, present or to come.

The night-heron or night-raven (*Nycticorax ardeola*, Tem.) said by Milton to sing, makes a dismal noise, which sounding through the gloom of the marsh when nothing stirs but the grasshopper or the frog, may well excite horror in the superstitious. The sight of these marsh birds in general, has a depressing influence on the mind. Their motions are either very slow or very rapid, and they have a dull aspect. Persons who live in marshes, lack the cheerfulness of mountaineers. They may be industrious and regular in their toils, but they want the elastic step and ringing voices, repeated by the mountain peaks. The Dutch in whose country the night-herons abound, are a grave people, little inclined to levity, who would be even more gloomy were they not so constantly occupied.

The spoonbill (*Platalea leucorodia*, Linn.), once a native of the marshes of Britain, has been extirpated. It must have made sad havoc amongst the fry and ova of fish, with its spoon-shaped bill, but it also eats many mollusca, so greatly destructive to vegetation. Most persons with very prominent lips, are stupid and sensual, as well as ungraceful, and lack vigour and skill in attack and defence. (See page 240.)

The spoonbills and ducks are often foolish birds, and cannot defend themselves with the same vigour as those with an elegant beak.

The sacred ibis of the Egyptians (*Ibis religiosa*), a fine species was adored in some parts of Egypt; and as it were in memory of the faded glories of that country, still builds on its ruined monuments. It has never visited our shores; but the glossy ibis (*I. falcinellus*, Tem.) a bird of the same genus is an accidental visitor, and from its dusky plumage has been called in the north the black curlew. It is viewed with some degree of dread by the superstitious of the north, and considered a type of the "Evil One," whose agent that nocturnal bird the common curlew is supposed to be. This last is the "lang-nebbed thing" of the Scotch; an abundant bird on mountainous heaths, and the supposed ensign of the Weird profession.

The dunlin (*Tringa variabilis*, Meyer) is one of the sandpipers; a class of little birds which are very beneficial to owners of marsh land, and were they abundant in cultivated districts, would there be equally useful; but they love the wild sea-coast. They are amongst the smallest of the waders, and show analogy to the little boys who catch shrimps as they walk in the shallows; without floating like web-footed birds—at home on the water.

The woodcock (*Scolopax rusticola*) one of the least intelligent of birds, is nocturnal in habits, and thus avoids many an enemy. As all the birds of this family lay great eggs in proportion to their size, their young ones when hatched are large, highly developed, and soon able to provide for themselves. Birds which can feed themselves as soon as born, when they attain maturity, are the most stupid of their class; for they do not appear to advance much beyond their earliest instincts. In like manner Negro children show more precocity than those of Europeans. Those children who are more deficient than the average, as regards the understanding of first principles, and possess fewer of the higher qualities of the mind; can often help themselves better than those of a far higher order; from their physical frames being developed to a greater proportion than their mental, at this early stage. Those birds that lay their eggs in nests, and whose young longest require parental care,

soar the HIGHEST, sing the SWEETEST and can TALK BETTER than their fellows. The *quality* of their instincts at a late stage of development, is far superior to that of those birds which in the *chicken stage* were more advanced. When we see them in their adult state, we can scarcely believe they were ever, even on an equal footing.

Throughout the vast Organic Kingdoms, *Precocity* IS THE GENERAL FORERUNNER OF PERPETUAL PUERILITY.

The adjutant (*Ciconia agala*), the grandest of the storks, rules amongst the birds and reptiles of the pestilential marshes of Bengal. The power of its gastric juice is so great, that it can dissolve bones. Its voracity is equal to its digestion, for it will devour all animal substances within its grasp. Cats, tortoises, birds, their eggs and young, and serpents of all degrees of venom, are alike consumed by this omnivorous bird. If it kills a few chickens, it destroys so much carrion and vermin, that it is protected as a public benefactor.

The East India Company may be compared with this bird. It rid Hindostan of many *reptile vices* which "poisoned society;" and if it devoured many small states, it "digested" them into one vast Empire. It was the King of Corporations;—THE ARCHANGEL, the Guardian of the Land.

The flamingo (*Phœnicopterus antiquorum*), a connecting link between the web-footed genera and the storks, possesses an extraordinary length of neck and legs, but a most slender gullet. Like the first it can swim on the surface, and like the second can wade in shallow water. They are magnificent birds on the wing, especially when an evening sun, and clear atmosphere, allow their brilliant scarlet hues to be seen to perfection. They fly in flocks, and have been aptly compared with troops of soldiers, in the costume of "the guards." They appear to be under the control of leaders, who give notice of the approach of danger. The flamingoes of America, like the recent armies of that country, appear in larger bodies than those of Europe.

They curiously enough build nests considerably above the surface of the ground, forming as it were stools, on which they do not sit, but stand, covering their two or three eggs with their tails. They have also been compared with clerks sitting at the desk, and thus may be a type of the soldier turned writer.

The whale-headed stork (*Balaniceps rex*) is an extraordinary bird, which has points of contact with another order of creatures. Its bill is evidently formed for scooping up ova; it thus feeds like the whale on much that is soft and blubber-like, although probably, unlike that monster of the deep, it can enjoy large prey.

It is not a little singular that this ravenous bird of Abyssinia should show a strong likeness to King Theodore. His poor subjects were as much his victims as the fish and young water-fowl are of the stork. We believe that an approximation takes place between persons much in contact. We were greatly struck with this on examining the portraits of a number of the late Abyssinian prisoners and that of Theodore. They had acquired, strange to say a considerable resemblance to their persecutor ; probably from having dwelt so long on his image.

The ruff (*Machetes pugnax*, Cuv.) is a beautiful bird, showing perhaps more variety of plumage than any known species, it being difficult to find two alike. It is ornamented with a rich collar of feathers, which gives it a singular appearance. It probably suggested the "Ruffs" round the neck, worn by man two centuries and a half ago, which were introduced from Flanders where the birds particularly abounded. The ruffs are stupid birds, but are excellent when fattened for the table, being caught alive for that purpose with the godwits.

The voracious ruff is the emblem of the Flemish or English *bon vivant* 250 years ago, who wore a ruff round the neck and a glossy and brilliant attire, like "Breughel de Velours." These birds and these men, were both born and bred in marshy districts, and were very prolific.

The moor or water-hen (*Gallinula chloropus*, Lath.), a long legged species, delights to frequent the shallows among the reeds and fens. It is an excellent swimmer and diver, although without webbed feet. This bird is of a dark, sooty, greenish purple colour, the general effect of which is black, but has a red bill and feet, and by its lively motions forms an attractive addition to the water-fowl on a pond.

The moorhen is a type of the little Marshman, who lives among the reeds, and is almost as aquatic in his mode of progressing from one little patch of sedge to another, as a water bird.

The corn-crake (*Gallinula grex*) connects the gallinules with the partridges. It is a land bird, affording excellent sport, and is a first class runner ; but most cunning ; for when it has not the opportunity of running away, it has been known to feign death (*Fesse*) in order to throw its captors off their guard. These birds are very abundant in Norfolk ; a country where the inhabitants shew more acuteness and sly dodging, than the bulk of those of our land. Norfolk is also famous for partridges, which play similar tricks.

The violet gallinule (*Porphyrio hyacinthus*, Tem.) is a splendid bird, being worthy to stand at the head of its class in "the purple robe of royalty." These water-hens of Africa, are of a cruel disposition, for with their strong bills they split open

the heads of chickens and eat their brains. They are a comparatively low type amongst birds, and show how inferior beings, attain in some countries a high and prominent place, and even clothe themselves in Imperial robes.

The *Notornis Mantelli* (Owen) allied to the water-hens presents also points of resemblance to the dipper (*Cinclus aquaticus*, Linn.) but it is as large as a goose. The great size of this bird, which belongs to an order which usually contains species of moderate or small size, is in harmony with the great development lower forms of life, receive in the islands of the Southern Hemisphere.

The coot (*Fulica ater*) inhabits similar localities to the moorhen, but confines itself more exclusively to the water. Its toes have little membranous appendages, like the grebes and phalaropes. It is a type of the "fresh-water sailors,"—the marines; better able to take care of themselves on the water than landsmen, but poor artificers when contrasted with the able seamen, who are represented by the true web-footed birds. The coot is also a type of the river waterman, always *afloat*, yet ignorant of sailing tactics. He is often a mean fellow, not to be trusted like the honest sailor.

The grebes (*Podiceps*) occupy the same place amongst those with rudimentary web-feet, as the divers do amongst true web-footed birds. They have both,—for their classes, the greatest facility in swimming. Both progress under water at a rate truly astonishing. The grebes are the type of the coast-mariners, who have not the same facilities for acquiring a knowledge of seamanship as those who make long voyages, yet are nearly as much at home off the coast.

These birds' heads are ornamented with various devices, like those which sailors are fond of wearing, and which are certainly akin to the grotesque. These species are sleek-skinned, and their feathers on the breast and belly, are like the fur of the seal or Platypus. Grebe has become a fashionable article of dress, like seal skin. The attire of sailors was at one time fashionable for gentlemen, not of that profession.

It is important to notice how the various classes of water birds, show an analogy with the different orders on land. Thus the albatross represents the vulture; the frigate the eagle; the skua the falcon; the puffin the parrot; and the tern the swallow. The penguin that cannot fly, the ostrich; and the swan as the largest in body of the water birds, the cranes and storks, as the largest of land flying birds.

The swan is awkward on land, but on the water it is at home, and passes there a peaceful, quiet and inoffensive life; for its

size and strength render birds of prey usually unwilling to attack it. In human society, those who can effectually defend themselves, are the least liable to molestation.

The full-grown swans when they have access to plenty of clean water are beautifully white. They are nearly allied to geese, but have much more intelligence, and display greater attachment for their offspring than the rest of the duck tribe. They defend them with courage, and show wonderful instincts in the preservation of their nests. In one instance related by Mr. Yarrell, a mute swan (*Cygnus olor*, Boie) was uneasy without any apparent cause, and a great quantity of vegetable matter being at hand, she was allowed to place it under her nest, which the next day was surrounded by a flood, and would have been swamped but for the foresight of the bird. From this it would appear that "Special Providences" watch over birds as well as over men.

Swans' necks are of great length, and form "the line of beauty and of grace," which must exist in the curves of the body of every beautiful and graceful woman.

The Anatidæ so peaceful, innocent, and so thoroughly at home on the water, are a type of the commercial marine. Swans are the emblems of great shipping companies, and geese of the old-fashioned ship-owners, whose motions are led by "antiquated ganders," while ducks, from the teal to the eider, typify the various coasting, yachting, trading and fishing craft; from the cobble to the good-sized merchantman. The white swan illustrates the modern clipper, whose passage through the water is so smooth.

The black swan (*C. plutonis*) of Australia which was thought in former times to have only "a mythical existence," is now abundant in menageries and ornamental pieces of water. But a few generations ago, steamboats with their black smoky sides were viewed as also impossible; but now we see them move along our rivers, as we do these dingy swans, whose red bills are like fire about the funnel's mouth.

The black-necked swan (*C. nigricollis*) of the far-off Falkland islands, appears to connect the black and white species, as their bodies are of a light colour, while their necks are dark. The white swan illustrates the clipper ship, and the black the steamer. This species with its red bill, typifies a vessel which combines the qualities of both craft,—the "clipper" with white sails, but "auxiliary screw" and fiery funnel.

Geese (*Anser*) are found in almost every country, different species being adapted to the hottest and coldest regions of the earth. Although it is the fashion to consider them the most foolish of birds, yet some species show a fair share of intelli-

gence, and they do not so readily as ducks, fall into decoys. Ducks are commonly more pretty and graceful than geese ; hence " Duck " has become as much a term of endearment, as " Goose " is of reproach.

The grey-lag goose (*A. ferus*, Steph.), one of the largest species, is believed to be the origin of our domestic bird, and is most widely distributed.

" A wild-geese chase " is an unsuccessful one, therefore the bird cannot be so stupid in its natural state as to render it the type of a complete simpleton. The goose in its domestic state, although not possessed of its wild instincts is extremely useful. With the exception of its liver, it is despised in France as an article of food ; but it is much valued for its feathers, down and quills.

The artificial manner in which it is fattened, excites horror among the tender-hearted, whose appetites are not under the influence of "*pâté de foie gras*." In close, hot cupboards the poor geese are nailed or chained to the boards, and fed with a spoon, until their livers are swollen to a great size ; while the rest of their bodies waste away. Geese become "*geese indeed* " when man makes them satisfy his morbid cravings, but in their native wilds, they perform the functions of the most sensible birds.

The eider (*Somateria mollissima*), one of the finest and largest ducks is a most interesting bird, from the habit it possesses to a greater degree than most of its tribe, of lining its nest with the down which it plucks from its bosom. The Laplanders visit its nest and rob it many times of some of its down, which the female continually replenishes from her breast. When she has exhausted this supply, the male assists her by stripping himself, and so a large quantity is eventually obtained of a substance valuable in commerce.

This habit of yielding support or warmth to offspring, shows analogy with the mammals ; for although down is not food, yet by protecting " the flame of life," it acts a similar part. We are told that males of the human species, have been known to suckle children, when females were not at hand.*

The eider was called " St. Cuthbert's duck," from its breeding so largely on his sacred island. It yielded an ample return for its shelter there ; but its numbers have been much lessened by the rapacity of those, who killed the parents of such precious down, in order to pluck the bird themselves. Had they been as wise as the Laplanders, they might have robbed the bird's nest three or four times in a season, and yet have maintained the species in undiminished numbers. Our ignorant,

* Carpenter's Physiology, 6th ed. p. 837.

degenerate population, although they have the possibility of rising to the level of the superior beings, which form the better portion of our nation, yet often show a short-sightedness and a recklessness, which the savages who live entirely by their wits, do not. Our artificial condition of society thus has its disadvantages and its drawbacks. The simple savage who does not attempt to soar so high as we do, cannot *fall* so low.

The mandarin duck (*Anas galericulata*), perhaps the most beautiful of the family, displays extraordinary attachment to its mate, and is said never to pair a second time. Mr. Davis relates that a couple of these birds were separated, by the male being stolen. The female showed great grief and refused the addresses of another male. A few days after, the former male was recovered and the pair were now happy; but the male whose addresses had been rejected was attacked desperately by the husband, who tore out his eyes.

This duck may well teach the Chinese a lesson in conjugal fidelity. Their husbands are sufficiently jealous of the invasion of their rights; but they do not set the example of chastity themselves. This bird reminds us of the Chinese in shape and appearance, having *a sort of tail behind the head, a prominent beak and forehead; a pigeon-breast with the wings on each side cocked up*, as when two swords are worn by a Mandarin. The costume of some grades of the Chinese mandarins consists of a variety of brilliant colours, the petticoat being of a small pattern; while the upper clothing is of a larger and richer design. Similar contrast of markings may be observed in the plumage of these birds.

The shieldrake (*A. tadorna*, Linn.) breeds in rabbit-burrows. The beauty of its plumage is its sole recommendation in the aviary, for like many ducks it is rancid and unpalatable.

The regard of some ladies for these beautiful though unprofitable ducks, these mere toys, which only possess attractions of plumage, is senseless and unprofitable. These ducks have their prototypes in the "Dundrearys" of the age.

The great northern diver (*Colymbus glacialis*), possesses extraordinary powers of swimming and diving. It shows great shyness and much cunning, for when it leaves the nest it covers its eggs and skilfully dodges its pursuers. It presents analogy with some beetles (*Dytiscus*), renowned for their diving powers and awkward movements on land. Sailors who move with so much facility on the water, have an uncouth gait on shore.

These birds illustrate the Greenlanders, who have like them a rancid odour, and who love fish and live on the water. But no human divers can move under the water with the rapidity of this bird. The *colymbus* dives into the recesses of the ocean,

and traverses regions at the bottom of the sea, which are *Terra incognita* to man. Could we follow it into its haunts, we should like Christopher Columbus, DISCOVER A NEW WORLD.

The guillemot (*Uria troile*) is one of the most foolish of sea birds, for it allows itself to be lifted off its egg by the passing hand. It makes no nest, and were it not for the pear-shape of the egg, it would roll off the narrow ledge of rock on which it is placed. This adaptation of form as a compensation for the low instincts of the birds, is highly important.

It is extraordinary that those birds which sit on a single egg, are the most numerous as species; such as the guillemot on the shores of Britain, and the penguins and petrels on other coasts. Their breeding places are little disturbed by man or beast, and as they live long, they may have a numerous progeny. There is every reason to believe, that no species of large vertebrate animal on the globe, is as numerous as man, and yet his births are mostly single.

The cormorant (*Carbo cormoranus*, Tem.) is a greedy bird, a type of those who devour as much as they can get. Its love for fish was turned anciently to great account in England, by its being trained to fish for a master. The Chinese also adopt this plan in the present day; the bird being afterwards permitted to fish for itself.

Those who make good servants, have *strong and violent lusts and inclinations*, which a skilful master turns to his own advantage: while servants who are merely amiable, and act to please and gratify others, are left behind in the more selfish chase for subsistence. *Strong self-interest*, is usually a more powerful inducement to exertion and economy, than the desire to serve others.

The pelican (*Pelicanus*) famous from remote antiquity, yields to few birds in interest. Except the swans and the giant albatross it is the largest of water birds. It is an excellent swimmer and has a powerful flight, but is awkward on land, and so dirty in its habits that the smell of its resting-place is perceptible from a distance. Its vast pouch can hold a great supply of fish; but it is willing to swallow any kind of flesh. Notwithstanding its uncouth appearance, it perches on trees with great facility, its plumage is beautiful, and an island inhabited by these birds is well worth a visit. The pelicans were anciently supposed to be the type of good mothers, who shed their blood to feed their famished young; but more correct observations have shown, that the bird for this purpose, only emptied its pouch.

The frigate-pelican (*Tachypetes aquilus*, Ill.) has analogy with light frigates of the most approved design, for they excite the

same terror in other birds that these ships inspire in smaller and less powerful craft. This bird hovers over the heads of the fishermen, in search of their finny prey. Numerous gulls and sea birds follow its movements, and when they see the net drawn they descend. The frigate allows the gulls to pick up the fish, but robs them of it when they rise into the air. In like manner our cruisers wait till the slaver has filled his ship, when they compel him to disgorge his prey.

The terns (*Sterna*) have remarkable powers of flight in which they resemble swifts, and like them breed among the rocks. They are good swimmers and remind us of those small yachts or pleasure boats, which are excellent for paddling or sailing. Terns are of various colours mottled white and grey with black beak (*Sterna hirundo* in summer), but others are entirely black (*S. nigra*).

The noddy (*S. stolidus*) unlike the British terns is a stupid bird, for it allows itself to be knocked on the head or caught on its eggs. It breeds on the Tortugas and other islands of the Bahama group. The natives were very tame when first discovered, and like these birds were almost willing to throw themselves into the arms of the stranger.

The gulls (*Laridae*) are supposed to be foolish and easily deceived, hence the appellation "Gullible." They swallow most animal substances, and are therefore valuable in a garden, to lessen the number of slugs and snails. Gulls are caught by means of baits placed on hooks, and drawn rapidly through the water after a boat. They are of different sizes, and vary considerably in plumage.

Gulls may be considered a type of the credulous amongst the seafaring population, who differ so much in degree.

The black-headed gull (*Larus rudibundus*) inhabits the fresh-water lakes and the marshy parts of the coast. It is a type of the heavy unintelligent marshman.

The skua (*Lestris cataractes*, Ill.) is far more courageous and intelligent than any of the other gulls. It does not fear the great eagle as it approaches its nest, but flies round and attacks its head with such fury, that the large bird is glad to betake itself to another spot. The skua so greatly exceeds the eagle in swiftness, that without danger it may annoy the noble bird. The flock of sheep feeding in the neighbourhood of the breeding places of the skua, often enjoy immunity from attack, and the shepherds accordingly greatly value this species.

The skuas are a type of the inhabitants of the Orkneys, who are a most choice division of our population, and are not to be excelled in spirit and daring. The skuas are supplanting birds, for they feed on the fish caught by other gulls. When the

Northmen came they made the former inhabitants Fish and Work, but defended them against foreign foes.

The fulmar petrel (*Procellaria glacialis*) breeds near St. Kilda, and is a ravenous devourer of fish, it is one of the most numerous species extant, and when caught vomits a clear green oil, which imparts to the whole nest a peculiar odour. This oil serves to feed the lamps of the inhabitants of St. Kilda. It is a fierce bird, biting furiously when handled;—a type of the savage fisherman who is angry when meddled with.

The great wandering albatross (*Diomedea exulans*) has been called "the vulture of the sea." Like the condor it roams over distant tracks, but substitutes the ocean for the land. Its flights are the most long-continued of any bird;—it must sleep on the wing or not at all. It flies from the Cape of Good Hope to Cape Horn; from Cape Horn to Kamschatka, and from thence to Australia; making the circuit of the globe in search of fish. No human emigrants can do more than this in search of their food; and this bird exceeds the most approved cutter or schooner in tactics, being able to fly within two points of the wind. It tacks like a ship, and must be a wonderful sight when it flies with an almost imperceptible vibration, on wings extending seventeen feet.

Nearly pure white in body, with quills of dark umber, it crests the surging billows. The same bird, recognized by its ruffled feathers, has long followed a ship in hope of obtaining some offal. It has an immensely powerful beak, and as a tyrant holds all the birds of the sea in check, often killing them for food; although not classed with birds of prey. It breeds in the most inaccessible islands in the midst of the ocean; its nest being like the home of the pirate. But these birds are too large and formidable to be the types of pirates. They illustrate a large and magnificent ship of the line, found in every part of the ocean. The albatross breaks the ribs of other sea birds, as the great Men of War do those of smaller craft.

The stormy petrel (*Thalassidroma pelagica*, Vgs.) is a little bird swift of wing, that flies near the water. Its advent is considered a token of the approach of foul weather, and is therefore dreaded by superstitious mariners, as a sort of witch or goblin. We cannot doubt that in stormy weather these birds seek shelter in the neighbourhood of rocks, or about ships which they mistake for them when the sea is running high, and the waves as they break, appear like "the breath of a furnace." Their sooty plumage is suitable to birds of such evil omen; this colour having been in all ages associated with melancholy, smoke and destruction.

They are full of oil like the fulmar; and the natives of the

Faroe Isles put a lighted wick in their mouths, and use the bird as a lamp. This reminds us of the way witches were "put out of the land." They were made *to light up* the dark gloom, from the middle ages to the seventeenth Century.

The penguins move with a sort of running splash along the surface of the water, in which they use their wings, but do not properly fly, for they cannot support themselves in the air.

The Jackass penguin (*Aptenodytes demersa*) is a brave bird, and does not hesitate to attack the legs or arms of man, if thrust into its burrow; most penguins allow themselves to be knocked on the head with impunity. When on shore it walks on its wings and feet like a quadruped, and brays like a donkey; and has all the obstinacy of the ass. There is a king penguin as well as several other species. All sit on their tails in an upright manner, looking grave and solemn. They resemble the little men with long bodies and short legs, who are very UPRIGHT, UNINTELLIGENT, and utterly incapable of SOARING.

The gare-fowl or great auk (*Alca impennis*) much to the grief of men of science, is probably extinct in Iceland, Newfoundland and Labrador where it formerly existed.

The southern penguins represent the stupid South Sea Islanders, such as the natives of Chiloe or Terra del Fuego, some of whom are harmless fools, while others are fierce like the jackass penguin. But the penguin of the north,—the great auk, which we fear has ceased to be, was a type of the ancient races who probably peopled these regions, and whom a superior race extirpated. This extirpation also is to be regretted by Anthropologists, who are always sorry to lose INTERESTING OBJECTS OF STUDY OF THEIR OWN KIND.

CHAPTER X.

THE RESEMBLANCE BETWEEN MAN AND ANIMALS.

GORILLA — CHIMPANZEE — OURANG — GIBBON — UNGKA — APES — PIGMIES —
 MONKEYS — LEMUR — LORIS — WING-HANDED ANIMALS — DOGS, AND THEIR
 VARIETIES — FOX — WOLF — JACKAL — HYÆNA — LION — UNICORN — TIGER —
 LEOPARD — CHETAH — JAGUAR — PUMA — LYNX — CATS — ICHNEUMON —
 WEASEL — STOAT — POLECAT — SKUNK — GLUTTON — OTTER.

THE far-famed gorilla (*Troglodytes gorilla*) is usually placed at the head of great apes, and surely it deserves this prominence; for if it does not so nearly approach man as *Troglodytes koula-kama*, yet from its superior size and strength it stands first. Whatever may be said of the proclivities of some of the great apes to man, still we must admit that there is an enormous distance between him and them. There are but Three Empires in Nature, the Inorganic, the Organic, and the Moral. Man is the only example of the moral kingdom within our present view; for apes *are not* moral beings.

The gorilla, an inhabitant of Western-tropical Africa, was for ages imperfectly known to Europeans. It was formerly considered as being invested with almost supernatural powers, and is still regarded as one of the most formidable of brutes; for it triumphs over the lion, whom it can drive from the field. It has, united in its powerful frame, the strength of several men, and could it be the servant of man, it would indeed be an efficient one.

The gorilla does not eat man's flesh, but shows an extraordinary enmity to him, slaying him with the slightest effort as opportunity occurs. It delights apparently in disembowelling or strangling him, for it possesses the most powerful muscular apparatus amongst large mammals, in proportion to bulk, and its grasp is truly "that of a Titan." It comes stalking to meet man, erect and beating its breast with violence; the sound reverberating through the dark woods, occasionally mingled with a fierce yell, sufficient to appal those who are not more than lion-hearted.

The gorilla is untameably savage—the wildest of wild beasts,—man's greatest enemy among them: its hideous cry, is said

to have the power of "nailing him to the ground." It is the spirit of the gloomy glades, the original of the Satyrs—who mock at man's calamity with the hideous grimace of Satan, whom the gorilla typifies; but only in Satan's savage character;—his *shaggy coat*, not his serpent form.

When we conquer the gorilla; survey his brawny limbs, "his villanously low forehead;" those superciliary ridges that scowl upon us even in death; or have seen that wide rough mouth gasp its last curse at man; we feel that we have indeed triumphed over an enemy who hates us.

The chimpanzee (*T. niger*) is much milder than the gorilla, and shows so many amiable traits of character, and so much intelligence, that we feel sorry our opportunities for observing it are so few. In the wild state it is savage indeed. It musters in large troops, and attacks the lion or man with great fury, using clubs and stones. If a man shoots one of them, its companions fly upon him in great numbers, and he can sometimes only escape by throwing down the gun, which the apes seize and break to pieces, as the author of the death of their associate. Having wreaked their vengeance on the gun, they appear satisfied and depart.

In the monkey tribe we see many imitations of man, who by attempting the performance of his actions, reflect ridicule on him. The Negroes in a savage state resemble the chimpanzees in their native wilds; and when under the influence of Europeans, they show an analogy with each other. Both are interesting from their quick observation, vivacious manners, and tendency to mimicry; but such only thrive in tropical climates, for if brought to Europe, they mostly become sickly if they do not speedily die. It would be as absurd to bring many Negroes to temperate climates, as many chimpanzees.

The ourang-outang or "wild man of the woods" of Borneo (*Simia satyrus*) is an immensely powerful creature; for according to some travellers, it rivals the gorilla in size, strength and ferocity. We consider their accounts exaggerated; the gorilla being probably an animal altogether unique in these respects.

The ourang of Borneo is not so erect in gait as the gorilla, and has more in common with the lower members of the monkey class. Its intelligence is not less than that of the chimpanzee; and the feats which have been related of its performance, are truly astonishing. It is capable of being made useful to man, who can fortunately by judicious treatment, turn its vast physical strength to account. It may be taught to pound paddy (rice in the husk) in a mortar, for hours together. It is a most interesting animal, and has great



THE GORILLA IN ITS NATIVE FOREST.

imitative powers. To a certain extent it soon learns what is said to it, and nearly abandons its former ferocity.

It resembles the Dyaks of Borneo, who are so savage and remorseless in a wild state, but when under the ameliorating influence of such men as Rajah Brooke, show a power of adapting themselves to the exigencies of civilization, and display much that can give us pleasure, as well as of what we can morally approve.

The agile gibbon (*Hylobates agilis*), so wonderfully quick in movement, and able to perform feats of activity that set human imitation at defiance, is generally most gentle in captivity. In a wild state it exhibits none of the ferocity of the more cruel chimpanzee and its congeners.

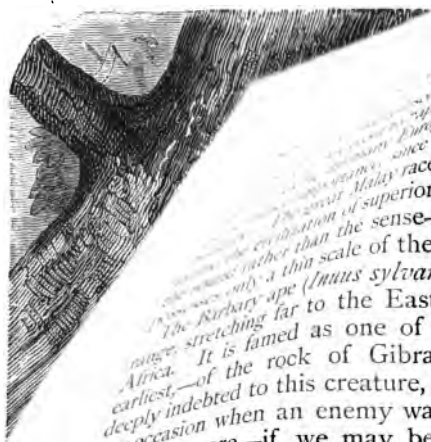
Among human beings, we find that some of our most agile athletes, are kind and good-natured, and less nervously irritable than most men. Nervous irritability is seldom accompanied by great muscular strength, as was first rendered clear by Haller, who held "that the irritability of the muscular system, is not dependent on the irritability of the nervous system."

The class of men whom we think resemble this ape, are long- and strong-limbed; small-bodied; short-lived; dark-skinned and bright-eyed. Such have wonderful skill in balancing themselves, and appear to walk great distances and run rapidly with slight effort; showing much muscular endurance. They have few of the finer feelings that belong to the superior classes of mankind; little of that nervous susceptibility which accompanies searching intellects; not that willingness to sacrifice inclination to duty,—the tendency of minds greatly under the control of the moral faculties.

Such men are soon worn out; "the flame of life" burns at a rate too fast for long maintenance; it being *ever in proportion* to the rapid circulation, induced by a headlong career. The athlete who does not relieve his muscles by active cerebral action, the *counterpoise* of great muscular exertion; if not killed by accident, is worn out at forty. Such is the result of men attempting to live like apes, whose structure is so different; they only kill themselves.

The ungka (*Hylobates syndactyla*) is another active creature, but is far inferior to the agile gibbon. This monkey, like some others, walks in an awkward manner on a flat surface, but is very nimble amongst trees and those creeping plants which interlace them, like the rigging of a ship. They remind us of many sailors, who are quite at home among the shrouds and spars, but who shuffle along the road in a most laborious manner.

The faculty of imitation, is much more frequently exercised in copying gestures and grimaces, than in assimilating to those



AS EMBLEMS.

The natives of Singapore, like European contrivances, and such European ways and tricks; but these they do not imitate European race, to which these people belong, but it is mere parody—the gilded counterfeit, which is only a thin scale of the precious metal.

The Barbary ape (*Macaca sylvanus*), is a species of the widest range stretching far to the East in India, and to the West in Africa. It is famed as one of the inhabitants,—perhaps the earliest,—of the rock of Gibraltar. The English nation is deeply indebted to this creature, for having given the alarm on one occasion when an enemy was at the gates of the fortress. These apes are—if we may believe many reports,—extraordinary imitators of man, gathering in troops to repel his attacks. They show great respect for any of their fellows that may be killed carrying away the body, and revenging the death on the assailant. They are formidable on account of their numbers, and they appear to obey the direction of a leader.

Apes have little place in Europe, the home of the great species is in Africa, or in the large islands of Sunda, where the population and fauna, show an analogy with those of the tropical continent. In the corner of Europe which most nearly approaches that dark land, within reach of the fiery sirocco, we find apes, probably imported from Africa, at a period coincident with the primeval peopling of Europe.

Outcast races are found alike in Asia and Africa, whose mingled cunning and trickiness, remind us of monkey-life. These are a near analogue of the Barbary ape, who keep with their own kind; and while they surpass some races of a higher order, in observation of petty matters, and in power of imitation; and can stoop to do what those of lofty stature cannot, yet seldom get beyond “monkey tricks.”

The “Pigmyes” were famous in classic story, and their combat with the “cranes,” was a subject for the pen of Virgil. There can be no doubt that this story was founded upon some conflict, which actually took place between apes and birds. In early times when the habits of animals were much less known than they are now, it is not difficult to imagine how these troops of apes were supposed by writers at a distance, to have been of a small race of human beings. They were little as contrasted with the human inhabitants of the country, who by their side might have appeared “Cyclopean giants.”

The pigmy ape of our day is an animal about twenty-four inches high, and is a great pest in the Carnatic, where it is

found ; being very injurious to corn and rice crops, and fruit gardens. They go in large bands to attack plantations, which are not protected by hedges of the prickly pear ; and to secure a safe retreat, they post one of their number on an elevated situation, to give notice of the approach of an enemy. He shrieks an alarm if danger draws near, and the whole troop has time to make its escape among the trees, to the inaccessible wooded hills.

The pigmies take the same place among apes, that "Tom Thumb" and other dwarfs do amongst men. His proportions are so insignificant, he is such a contrast to the gigantic specimens of human nature, that Man likes to contrast them.

When our minds are clouded by ill health, we are apt to think our blessings "pigmies," and our troubles "giants." But when we recover our equanimity, we perceive how that on the fair Earth the dews and rains of Heaven, raise a luxuriant crop of fruits and flowers and every appetite is satisfied. Then may our Pigmy troubles spoil the green garden. We may wish they were not there, but now we know how *small* they are. We have but to stir boldly and they vanish. Still they leave disorder behind, and this disorder gives us work ; so we make our fences more secure and keep our troubles out.

The entellus monkey (*Semnopithecus entellus*), a native of Hindostan, is a species treated with divine honours. The Hindoos worship this creature, probably because it is so destructive to their property ; fear being the principal means of ruling their minds. It commits immense depredation on their gardens and fields, but still they look on, and do nothing but cry, evincing the extreme of ignorance and folly. It is fortunately destructive to serpents, which is some compensation for the property it destroys.

The conduct of the natives of Hindostan towards those who do them ill in the animal world, to whom they sacrifice as Evil-Genii, explains the character of their minds ; which cannot worship without *dread*. They are less capable than many nations of appreciating sound moral government. They have been the prey for ages of more spirited nations, who make a spoil of their fairest possessions, but also slay their serpent-like banditti, who like reptiles are apt to strangle them in their paths.

The monkey-tribe, including the apes and baboons are remarkable for curiosity, delighting to examine objects, in a very thorough and scrutinizing manner. They possess a power of balancing themselves, of judging of distances and recollecting countenances, which many higher beings do not. They have enormous muscular strength, are commonly vain and capricious,

and their power of mimicry, has caused the name "Monkey" to pass into a proverb.

We see men resemble this class of animals; they are mostly distinguished by dark skins, thin frames, low noses, bright piercing eyes, high cheek-bones, and long upper lips. They are quick to perceive and imitate, and soon acquire the tricks of trade. They are commonly much attached to their offspring; are active and know how to take advantage of others; are very little influenced by high moral principle, and yet keep within the law, and the usages of society. They are well spoken of by the world, because masters of its maxims, and quick to follow its ways. They generally rise in position, principally by trampling on others, often better than themselves; and who, by aiming higher, are unwilling to practise the tricks these monkey-like men adopt.

They have little benevolence or kindly feeling, and are always ready to take advantage of the defects or failings of others; for which they have an "eagle eye," but a mole's eye for their good qualities; except when they can turn them to good account. They value property much, but not so much as "the world's opinion."

The little ape-like men commonly rise with the aid of some great man, which gives them a high elevation, of which they endeavour to make the most; and look down accordingly on the less servile and impudent members of the human species. Lastly they are revengeful and distrustful, and are by no means to be trusted with untold gold. They occupy a higher position than they ought, on account of their mountebank tendencies.

Those monkeys which ride on the backs of larger animals, are like those little men, who profit by the labours of great ones. They are inferior in status, but often greater in elevation, being nearer "the skies."

Thus on the great elephant's back, the little monkey mounts, and although less powerful as a creature, is nearer heaven. But on the monkey's nose a gnat settles, the smallest of all, but highest;—and it can fly.

From the monkeys we naturally pass to the lemurs, a class of four-handed animals found in Madagascar. They are shy of man, whom they do not attack, yet are capable of defending themselves with great spirit, giving severe bites with their sharp canine teeth. They roam about in troops at night, roar loudly through the forests, but remain in their places of concealment during the day. Their food is fruits, reptiles, insects and birds of small species. They are easily tamed when young, and become attached to their keepers; but if irritated can inflict

severe wounds. They are very agile and graceful in motion, carrying their long bushy tails high in the air. They are more suited to our cold climate than monkeys, and are more gentle in their ways, but are not so amusing and intelligent.

We see in lemurs a resemblance to a class of persons not uncommon in society, who do not show the energy and quickness of the monkey-like men. Not being able to enjoy sunlight, they are apt to "turn night into day." This description applies to a class of foreign ladies, who are little abroad during the day; but as long as you feed them with flattery, or what is more substantial, they are glad to see you at their evening parties.

The slow-paced loris (*L. tardigradis*) inhabiting Hindostan, Ceylon and Java, is another nocturnal animal allied to the lemurs. It is so sluggish, that it is obliged to seize its prey when they are asleep; consisting of little birds, mice and insects.

In walking along the boughs of the trees, it fixes one hand steadily before the other, to make sure of its footing, and does not easily turn back. This mode of progression, is that pursued by the Dutch colonists, who put one foot slowly and cautiously before the other, and seldom turn back or miss their aim, however slowly they may attain it. They have colonized the countries inhabited by the loris, whose prey may be compared with the human aborigines.

The slender loris (*Stenops gracilis*), is said to have a double tongue. The upper tongue is like that of a cat's but smoother; the lower is narrow, white and sharp-pointed. As each tongue has an independent motion, they can be used singly or together. The double tongue greatly assists in catching its insect prey.

"Double-tongued" individuals in human society are not popular, and are dreaded for their malice and hypocrisy. The upper tongue of this loris which resembles that of a cat, typifies cutting speeches uttered in an open manner; while the second tongue, may illustrate "backbiting."

The wing-handed animals (Cheiroptera) are gloomy in habits, nauseous in smell, as well as loathsome in aspect. We do not wonder that in a superstitious age they were supposed to have affinity with the departed spirits of bad men. These are equivocal animals, winged like birds, yet not birds;—the link between two important orders. They are wonderful in habits, and are endowed with an exquisite sense of touch, conveyed to their brains through their membranous wings; which receive impressions from the air, with almost as much delicacy, as a tympanum or drum of the ear. This extraordinary sensibility, is thought by some naturalists to be a NEW SENSE.

European bats are mostly insectivorous, feeding on the swarms of gnats that rise at sunset, and the moths that hover in the dusky shades.

Artists give wings with feathers, to divine messengers for good, but vampire's wings to those who watch us while we sleep, to do us mischief.

All spiritual messengers work out the Divine will,—a glorious end—whether they are gloomy and bat-like, and the glimpse we catch of them makes us shrink ; or whether they are typified by “birds of good omen.”

In Isaiah (ii. 20) we are told that when men leave off idolatry, “they cast their idols of silver and gold, to the moles and to the bats.” Their idols are suitably resigned to these emblems of “terrestrial darkness,” and celestial blindness—the mole and the bat ; as a brighter light dawns on their minds.

The size of bats typifies the strength and power of superstition, which varies in different countries ; some of which are so oppressed by it, that they may be compared with dark holes in which bats reign. These are surely the caves of superstition. Light but dimly shines when introduced, as does a torch into the home of the bats, which endeavour to extinguish it, as they flit in terror round, and pollute it, as they do its introducer.

Throughout the East, the bats darken the chamber lights, in many an old and damp building ; especially in India—“a benighted land.” There the bats reign in nearly all the Temples. Hardly a house but has many bats,—“the messengers of darkness.” But they will leave us as civilization *enlightens* ; they cannot bear the daylight, like their types the Evil-Angels ; who are much greater in power than unaided Man. Like bats they can raise themselves above the earth, which man cannot.

Throughout the gloom the bats reign ; we only see them in the twilight, but their greatest power is at midnight :—such is a type of a period of gross idolatry. All countries go through night and twilight stages. Such appears in many temples, the “*light*” is *there* “*subdued* ;” the people led by bat-eyed priests are kept in gloom.

In England and in Europe, the bats are *smallest*, and the inhabitants are more enlightened ; but in tropical America the bats are of great size, and sometimes feed on blood. In the islands of Sunda and Madagascar, they are large and mischievous. In all these countries, the inhabitants are plunged in gross superstition and idolatry. But these idolaters have not within the memory of man had the “daylight of truth.” As they come in contact with the great Western light, its twilight comes upon them : the daylight follows without break ; but still the darkness which precedes the *dawn* is grossest.

All these changes roll round the moral world. First it is TWILIGHT; then THE NIGHT, afterwards TWILIGHT: last THE DAY.

Bats are important as illustrating the position in which the spiritual world stands to us. They are intermediate between birds and quadrupeds. The types of the three classes of moral beings—the Divine, the Angelic and the Human.

The horse-shoe bat (*Rhinolophus ferrum-equinum*) is formidable only to moths and beetles, which are but a type of what is so much dreaded in less favoured lands than ours. Some persons like "moths" and "beetles," flutter round the candles of the priests. These are the "prey of superstition," as the insects are of the horse-shoe bat.

Our ancestors nailed horse-shoes to barn-doors, as a means of preventing the visits of the "evil one," this indicated a "wholesome," although unreasoning dread of witchcraft.

The rousettes (*Pteropus rubicollis*) of the moderns, are doubtless the "harpies" of the ancients, which were described by them as fierce monsters, rapid in flight and fetid in smell, polluting everything they came near. Such according to ancient story, were sent by the gods to punish the blind Phineus. Their faces were lean, and hungry was their aspect; which if we accept classic fable in this case to illustrate fact, would lead us to think of those who subsist on the food of others, and leave them without provision, destroying even what they cannot devour. Of such are many thieves, who in order to rob, destroy and defile the property of the poor.

The kalong bat (*Pteropus javanicus*) feeds exclusively on fruits, plundering alike, the garden of the poorest peasants of their common and coarse produce, and the sumptuous gardens of the chiefs and nobles, whose trees are covered with the choicest fruits.

The Malay thieving population of the Sunda Islands, who live on the spoils of the respectable citizens, cannot be extirpated.

Pteropus edulis, while it plunders the natives, gives them its flesh in return, which is some consolation for an orchard robbed. This is an instance of just compensation, made for injury done to property. Those who rob the community, should be made to pay in person or in pocket.

The "*fer de lance*" like the vampire, has a nose in the form of the point of a lance, which is suitable to a creature of blood-thirsty habits. We wish all human cutthroats had a similar distinguishing mark.

The true vampire (*V. spectrum*.) is a creature from which we shrink with extraordinary disgust and horror. Hovering over its victims with quivering wings, it descends, and fans him

gently, as it breaks his skin and draws his life-blood. Its appearance is sufficiently revolting to most Europeans, but the natives of tropical and South America where it is found, do not so much dread it.

The vampires resemble the priests who have so long "sucked the juices of the state," and so well know how to soothe "the national conscience" to sleep, as they draw its substance. Vampires are very abundant in Chili and there the priests also have much power. In their midnight festivals, they deaden the conscience with mummeries, like the undulations of the vampire's wings.

Some feel not the vampire's bite, yet when they wake, recoil with horror; but may exhausted, go to sleep again,—be fanned, and their blood drawn again; until worn out they expire.

All vampires are not equally destructive; there are large and small species, and they can live on other food besides blood.

Let stringent laws be passed to keep human vampires within proper bounds; and let them *be made* to cultivate waste lands in their respective countries. Then the moralist may be reconciled to their presence.

The varieties in the breeds of dogs are great, possessing as they do many distinct characteristics, perhaps as many as the occupations and characters of their masters.

It is curious but true, that dogs which are much with their owners, often resemble them somewhat in expression; which adheres to them even when they return to their compeers. Sir Edwin Landseer has most ably depicted an assembly of dogs, illustrating the characters of men, in his wonderful picture of "Laying down the Law."

The mastiff is in some respects a noble dog. He is forbearing to small dogs, scorning to attack them. He is fearless in fight and capable of tearing a man to pieces, and unites courage with strength in a great degree. To his master he is almost always faithful, but to other persons he is often surly and fierce.

Those persons who are square in build, have mouths drawn down at the corners, and daring stern eyes, are often like the mastiff in character. Such a style of countenance is not very uncommon in England. Under a considerable share of moral restraint, these persons are generally faithful to their employers, but very gruff in manner even to them. To visitors they do not like, they are even more disagreeable, grumbling and showing their large and prominent teeth like a surly dog. Hospital and workhouse porters, relieving officers and parish clerks, sometimes have this style of face. They are often useful, from the

extraordinary animal courage they possess ; are always prepared to attack, and have indomitable vigour in defence.

We shall describe male and female examples of this character of man.

They were born in Yorkshire. The boy at the age of fourteen years, was taken into the stable of a country gentleman. He was honest and straightforward, and detected the old groom selling his master's corn. Of this he informed his master, and the groom of twenty years' standing, lost his situation. The boy got an awful amount of abuse from all the servants of the establishment, but he just shut his mouth and growled. At twenty he had the entire charge of the large stables.

He was six feet high ; and stout and muscular, with high-cheek bones, and an excessively broad and massive bony chin. He had two long projecting teeth in the upper jaw : ordinarily his mouth was firmly shut. His head was flat on the top, and rather square on the sides, in accordance with his whole build. When he opened his mouth, he spoke with great decision and force, and was not to be taken advantage of in a bargain, for he was very exacting, and could silence most persons with a volley of abuse. Ordinary men obeyed his very look, and his word, known frequently to be followed by a blow, inspired terror in the stable-boys.

He would not be interfered with by any one but his master. Not even the collector of rents had any influence over him ; and the man, although an attorney, was obliged to put up with insolence from the trainer of a stud. He was otherwise a decent and respectable character.

His sister was as formidable in her way, as he was in his. She was the matron of a female Reformatory. She was five feet six inches high, heavy and muscular. She was very strict and insisted on implicit obedience,—the strictest adherence to the very letter of the regulations, and punished breaches of order most severely.

She was the only matron in an institution containing about fifty girls ; but it was better conducted than several other institutions, which had double the number of attendants in proportion to the inmates. Her rule was only relaxed, when those under her care were prevented by actual incapacity from fulfilling her commands.

She was not reckoned unkind, but ruled by fear, and not by love. The servants who came out of her establishment, were noted for their respectful manner ; hard-working, and cleanly habits. Her style of countenance resembled that of her brother ; square in chin and firm in lip. She had a loud, thundering voice, that could be heard all over the house.

Like the mastiff, her offspring were few, but very formidable, and her only son became a first-rate drill-sergeant of infantry.

The bull-dog is more exclusively devoted to fighting than the mastiff. It has immensely high cheek-bones, a comparatively square forehead, broad chin and flat nose : its eyes are daring almost beyond expression. It is always ready for a fight against any odds, as its self-confidence is immense. It is not fat, but from the size of its muscles appears stout, and it is rather short legged. It does not bark so much as other dogs, but rushes on the foe with great fury, and holds on with a pertinacity that only death can conquer. It is the fiercest of dogs, and its courage in proportion to its strength is prodigious ; and as this is great, it rules amongst the dogs, and drives almost all of them before it.

"John Bull" is supposed to be a powerful animal, but even he is held in check by the British bull-dog ; small compared with himself, and of insignificant strength.

We remember a little man a sprig of the "British weed called law," a stout, strong fellow, though 'not much above five feet high. His expression resembled that of the dog in Landseer's picture of "Low Life," and like that animal his mouth had a slight twist on one side. He was light haired, had powerful limbs, and was pre-eminently ugly ; for he had hardly any nose.

We were told that as a boy he showed little skill at marbles and other games, but generally got the largest share by pure bullying and insolence. As a lawyer he was always ready to take up any cause however bad, if it held out the least prospect of success.

He courted a woman about six inches taller than himself, rich and good-looking ; but who for years regarded him with the greatest contempt. He still persevered, and having once got a footing was not one to draw back. They were married, and for several years he repaid all the insults she had bestowed on him. He was very exacting. As an instance of this he purchased a house in which a highly respectable gentleman was located. The gentleman received notice to quit, but stayed a day over the term. The lawyer sent in a demand for the quarter's rent, and not being paid put in "a distress," knowing that the gentleman was away from home. The gentleman brought an action for trespass and got damages from the bull-dog lawyer. He was also nonsuited in two or three cases, in which he was personally concerned. About the same time he was seized with an illness, and died at length of chagrin.

Bull-dogs when they cannot get what they want, and are too much confined, sometimes pine away and die.

It was interesting to watch the way in which the little lawyer treated cases; he would quietly wait until an individual was fairly committed to a course, would then rush in like his canine prototype, and hold on, until the foe was subdued.

The greyhound is one of the hunting dogs, and shows a singular resemblance to many of those who train it; being entirely occupied with the chase. It is the swiftest of dogs; is agile, clean skinned, and has an elegant contour. It scents game with extraordinary quickness, but is much less capable of understanding what is said to it than most other dogs. It has also less affection for man, and is apt to snap suddenly at those near it; but barks little.

We remember an individual who answered in many points to this description. He was long-limbed, long-nosed, and long-faced, and certainly not ungraceful. Without being addicted to any positive vice, he was one of the most unprofitable members of society. He cared little for mental cultivation. He practised no art, and read only racing calendars and sporting newspapers. His whole thoughts were given to training dogs for the chase during the summer, with occasional fishing. Winter-time was his glory. His powers of walking were marvellous, and he could ride fifty miles a day after the hounds. He did not care much about business; there was a sad want of order and regularity about his movements; and he could not be depended on for punctuality.

When ill he generally fancied himself a great deal worse than he was, and could as little amuse himself with things in general, or feel at home in doors, as one of his greyhounds. His observations of size and locality, were remarkably keen and exact like those of that animal. He was generally taciturn, and had a difficulty in expressing himself fluently or with precision.

The bloodhound is a splendid animal, but has little general intelligence in executing commands. It has a most powerful, deep and sonorous bark; which makes the whole ground shake. It has a fine, clear, fierce eye. Untiring in pursuit, at the bidding of its owner, it follows the scent indicated, with an extraordinary pertinacity.

It is not the strongest of dogs, and has little generosity or love of mankind; it seeks only blood. Like many of the Indian tribes of "the far West" in North America, it is nearly extinct. They resemble the bloodhound in their thirst for human life, extraordinary skill in tracing and distinguishing trails, with that fine, wild, ferocious aspect, which sometimes characterizes the true savage. Like the bloodhound they can be enlisted on the side of a white master, yet lose none of their

native ferocity ; and like him they are more pleasant to read about or see under restraint, than to encounter at liberty.

The poodle was thought by Sir E. Landseer to resemble a judge in his wig, and as such, is represented in "Laying down the Law." The poodle is wonderfully intelligent. The tricks that he learns, exceed what can be taught to any other canine variety. He is the actor and mountebank amongst dogs. He has been taught to fire cannon, to personate a sham fight, to feign death, and to take part in a siege. He possesses certainly more power of mimicry than any other dog ; but has much less power of adapting himself to a useful purpose. He is an indifferent mouser, ratter or rabbit-catcher, and is even inferior as a watch-dog, to the small and feeble spaniel.

The low-class actors among men, are equally useless. They can mimic the occupations of others, but cannot be steadily useful themselves.

The Skye terrier is a strong-smelling, dirty dog in its habits. It possesses extraordinary intelligence and great energy for its size. It can hunt the otter with success and is a useful, interesting little animal. It has lately been the fashion to visit its haunts, for it has long taken a high rank in the market.

It is like the dirty, but thrifty and enduring Highlander, who has been so much admired of late, yet can be greatly improved by the use of soap and comb, like his shaggy compatriot.

The Pomeranian fox-eared dog, and the Esquimaux dog, have a strong likeness. They have acute powers of hearing, but have less domestic affection than most other dogs. From the facility with which they act together, they are of great use in the countries where they are found ; but they show a good deal of the craft of the fox, and none of the nobleness that some of our other dogs exhibit.

Finnic or Hyperborean races of men, show strong analogy to these dogs. Crafty, wide-headed, flat-nosed, and oblique-eyed, they display much less attachment to their offspring than other varieties of man, and have less power and are of less importance than most other races. They live almost wholly on fish.

The English toy-terrier is a spoiled creature of fashion. It is the most useless of dogs, and a fit companion for the most useless of men. It occupies attention which might be better bestowed ; it engrosses affection which might be better directed ; it eats what might feed higher animals and in all respects leads a spiritless life.

Born on soft cushions, fed on creams, steaks and oysters, it is caressed until it loses all care for those who do not caress it. In youth it is rightly named "Frisky," but as it advances in life, fat the offspring of indolence and overfeeding, induces laziness

and disease, until it dies before its time, perhaps without posterity, and unlamented except by its mistress.

The Dalmatian coach-dog, neat, clean, fond of horses, dressed in showy bicolored uniform, fierce to strangers, is more for ornament than use. Like the footman whose portrait appeared in *Punch*, who asked the question, if he was wanted "for work or ornament," he is admired in the kitchen and the stable, and follows his master's carriage, or rides on it. He cares for little that is profitable, still less for what is exalted. He is obliged to keep himself clean, but his food and drink are his greatest pleasures. He is surly to those who are less well dressed than himself; yet is useful and necessary in his proper place; but if he steps out of it he seems offensive.

The Turkish or Tartarean guard-dog, is a grand variety, immensely powerful, and more formidable in conflict than any other. They guard the flocks from the attacks of wolves and bears.

They may be compared with the Caucasio-Mongols, who defend the effete Georgian races from the typical "wolves and bears" of pure Mongolic descent, and are magnificent men; vast in size and prodigious in strength. They can bear more than most races on earth.

The St. Bernard is a powerful, noble, generous variety, having an apparent affection for mankind, and possessing the greatest amount of tractability in proportion to its strength, of any dog, except the Labrador. From its utility in mountain ascents, it might be a member of the "Alpine Club," and few members of that body have been the means of saving more lives than some of these dogs, for they are true *avant-couriers* in times of danger. It must however give the first place to that acknowledged "member of the Humane Society" the Labrador or Newfoundland breed, which appears to have qualities, nobler in some respects than many men. Some have been willing to sacrifice their lives for their masters, or even for strangers in distress.

They resemble in character, a class of Englishmen, who are tender to children, humane and gentle, anxious to save life, and not sparing of their own.

The Russian setter is a rough curly dog, excellent for beating game, but has little ferocity of disposition;—the killing part must be done by other dogs. They are not allowed to eat the game which they assist in procuring. They resemble the rough foresters who are not allowed to kill game themselves, but drive it towards a given spot, to be slaughtered on the occasion of a grand *battue*.

These dogs have many excellent qualities and are not inferior

in intelligence, to those varieties which usually bear a higher price. They can be turned to a greater variety of purposes than most other hunting dogs; like the Russian peasant who is often master of several trades.

The colly or sheep-dog is knowing beyond other dogs, and its intelligence is of a useful kind, more so than the lap-dog, who can proverbially "do everything but speak."

On the desolate Scotch mountains, it tends the gentle sheep; or in the vale where the broom grows. Hardy, undaunted and courageous, it is the most single-minded of dogs, and shows great capacity for everything connected with its business.

It may be compared with the docile Scotch peasant, hard working, indefatigable, shrewd, knowing, and with an indescribable twinkle in his "e'e."

The colly is often a shabby and dirty-looking animal, but is yet so intelligent, and the more favourable specimens so valuable and trustworthy, that we are inclined to place it as we do the Scottish peasant; at least on an equality with the sleeker and more orderly English mastiff, and his analogue the English bailiff or porter. For he is much more self-denying, thrifty and acute, than his English brother.

The sheep-dog is said to be unsympathizing with his species; which is partly owing to the way he is brought up. Isolated at an early age from his kind—suckled by a ewe—and devoted to a particular employment, all his sympathies and energies are given to it. He has little in common with the smooth town dog, so well fed, fat, and inclined to sensuality.

The Scottish peasant has little sympathy with the English labouring class; he is more thoughtful, knowing and pawky; but is considered mean and queer in habits by his Southern compatriot. Self-denial is more easy to the better class of Scottish peasantry, but the English in general, glory in spending their resources as fast as they accrue.

The sheep-dog is a cross between two breeds, and in this respect it resembles the Saxon-Gael to whom we refer, and combines like him the qualities of two races. He is the foster child of a more numerous race, individually weaker than himself; but being numerically superior, they absorb him.

The naked dog of Guiana, is a feeble, unintelligent, spiritless little animal, suited to an enervating climate. It is the companion of that sickly effeminacy which characterizes the weak races of South America.

These human and canine varieties seem destined to *give way and disappear*, before a CLOTHED, HAIRY AND STRONGER RACE OF MEN, and A MORE USEFUL and ENERGETIC BREED OF EUROPEAN DOGS.

The Blenheim spaniel, is a very pretty dog but nearly useless, except to please the more empty-headed members of the fair sex. It usually has its tongue out, a sure sign of a long one. It is the spoiled child of luxury, the companion of vanity and the sport of what is trivial. It is like its mistress in many respects, sleek-skinned, and attired in a silky robe. She has everything done for her. Her hair is combed by her maid, her meat is cut up for her and the same carriage appropriately contains her dog and herself. She is spoiled by fortune or rather by its abuse.

The Blenheim spaniel is more inclined to waddle, and less snappish than the terrier. Like its mistress it uses its long tongue in noisy demonstrations in other persons' premises, and is as little welcomed, though equally caressed and flattered.

The King Charles's dog, is delicate, small, and elegant, but has a flat nose. It is highly intelligent, and excels most dogs in its capacity for learning tricks. It does not want spirit for its size, and is extremely watchful. It is the greatest contrast to the bull-dog, the impersonation of animal courage and ferocity, with the least fear of danger. The King Charles's breed, has none of the nobleness of the hound or Newfoundland.

High-nosed races amongst men, are commonly independent, and have a certain repugnance to what is low; so amongst dogs which have long high noses, they do not show the pliability of the spaniel or "King Charles," such being inconsistent with their single-minded characters. The sheep-dog, combines the high nose of the hound, with the round-headed characteristics of the King Charles, and so has two characters.

The King Charles has its analogue in the small, weak-muscled, nervous, delicate, but accomplished individual, whose intelligence and accomplishments benefit mankind little, on account of deficiencies in physical force and single-mindedness, and partly from not having been in circumstances to develop an independent character. These men are more amusing for a leisure hour than useful; more fit for the drawing-room than for the field of active usefulness; and although acknowledged to be clever, are apt to become plethoric and sensual in prosperity.

The Italian greyhound is an importation from Naples in Southern Italy. Graceful above every other dog, it is delicate, and its highly nervous temperament, renders it particularly sensitive to cold. It was probably a superior breed originally, but has degenerated. It is a special favourite with the ladies, but has been much overrated.

The high birth and polish of the nobles of Southern Italy, make them ornamental to society; but their indolence, igno-



rance and uselessness, render them of as little value in their sphere, as the Italian greyhound.

The pointer is the most intelligent of sporting dogs, and enters with spirit into the chase. He ranks above the setter, and is trained not to kill the game for his own eating, but to act at the bidding of his owner. He finds the game, and is followed by his master who kills it.

As the setter shows analogy to the mere beater of game, so does the pointer to the gamekeeper, who finds the game for his master to kill.

The fox (*Canis vulpes*) is a cunning and vicious specimen of the genus *Canis*. Cowardly and treacherous, it never attacks any animal as large as itself, and is extremely injurious in well preserved districts. It is wide round the ears and has oblique eyes.

Men with this configuration are apt to be "foxy" in their habits, and their ears stick out, much like those of this animal. They are disagreeable to deal with, and are never straightforward, but are given to double dealing. They seldom do anything without a bribe, and though they preserve a smooth exterior, slyly destroy the very bowels of society.

The fox is cosmopolitan, so it cannot be entirely extirpated,—let it continue an *example of cunning*, to be hunted down in every country, and driven out of localities where it can be most injurious.

The "fox earth" is a deep hole dug by the animal itself. It has generally a way of escape, often having two holes to its lair, which a more straightforward animal would not think of.

The wolf (*Canis lupus*) is the most ferocious of the genus. Larger than most dogs, it combines the treachery of the fox with great strength and hardihood. It is nocturnal, and stealthily approaches its prey, unless maddened by hunger. In winter they assemble in large packs, and frequently do not hesitate to attack with fierce cry, any living object they meet. They creep down from the mountains upon the sheepfold or the unwallled villages.

Scripture and classic fable, alike accept the wolf, as the most powerful illustration of some of the least amiable traits, seen in human character. "Benjamin shall ravin as a wolf; in the morning he shall devour the prey, and at night he shall divide the spoil" (Gen. xlix. 27). This is singularly applicable to the habits of the fierce Affghans who call themselves Benjamites. Wolves and Affghans come down on the villages and unwallled towns, slaughter and destroy in the morning, and in the evening riot over their plunder.

Wolves are considered the scourges of the East, and destroy more human lives in Hindostan than do any other beasts. The wolf in sheep's clothing, a Scriptural and classic parable, is applicable to our own age. The wolf dressed himself in the skin of the sheep, and was for some time unperceived by the shepherd; although he slaughtered many of the sheep. At last he was detected, caught and hung with the sheep's skin still clinging to his back. The analogy drawn in Scripture is sufficiently striking, between the wolf who clothed himself in sheep's garments in order more effectually to plunder the sheep, and those who enter the church on false pretences.

The wolf in sheep's clothing, may for a considerable time escape detection, but when he is discovered, the indignation against him is in proportion to his formerly supposed innocent character. His position becomes untenable, and he is "cut off like an unprofitable branch," or exalted on the "tree of infamy," a perpetual witness to condemned hypocrisy.

The jackal (*C. aureus*) the most cowardly of beasts of prey, is ever on the look out for the most helpless animals. It is not particular in its choice of food, but wherever the dying, the sickly and exhausted sheep are, there it goes. Where a carcass is being torn by large beasts of prey, there it delights to howl; the meanest of them all, more craven than the fox or the hyæna.

The jackal is said to be the lion's provider and to act in concert with him. The jackal eats what the lion leaves. Where the "British lion" roams, from the Hindoo Koosh, to Cape Comorin, where he marches to the battle-field with his trumpet roar, there the jackals, or native Allies howl. Vultures which from afar watch the slaughter, approach as the lion leaves its prey, and flap the jackals with their fetid wings.

These vultures remind us of the camp followers, who grow rich on the battle-field. They strip the slain, and hasten the exit of those departing from the world.

These robbers are often so encumbered by their ill-gotten booty, that they have a difficulty in travelling, they are like the vultures gorged with carrion, which can fly but slowly. If these camp followers stray behind the army, they and their spoil may fall into the power of a skirmishing foe; and are as helpless in his hands, as those bloated birds of prey. Yet these vultures and camp followers, may assist in keeping the encampment clean, and thus tend to the general good.

The hyæna's (*Hyæna striata*) aspect is repulsive. Malign, inexorable, and untameably savage, its eyes shine like lucifers in the dark night; its stealthy, dusky form surprises us. The courageous man fears it not. It fears the light of day, and

strangles what is weak and straying from the path. It mocks its prey with a laugh!

We once saw one in human shape, whose physiognomy and expression somewhat resembled this ferocious beast. She was clad in grey! her hair was grey! her eyes were grey! they had no womanly softness, no tender sentiment, no exalted emotion! She had little human sympathy. She had a gross fondness for her offspring, but did not desire their moral good, and would howl "when they left off breathing and no more." She had no love for virtue; or pleasure in good deeds. She held her tongue until she saw the virtuous err, and then her mouth was open, and a hideous laugh displayed her glee.

The lion (*Felis leo*) in Proverbs is said to be the "strongest amongst beasts," he is certainly one of the most powerful in proportion to his size. He has been accepted as the emblem of strength amongst Oriental and European nations. The lion was on the standard of the tribe of Judah, to typify the ruling character of the tribe, which gave Kings to Israel. The Jews are not the most numerous, but in proportion, are among the most influential of men.

The lion as a beast of prey, is of little value to man, and typifies the violent and lawless amongst governors; as many of the Kings of Judah were. They may well be contrasted with the ox, the emblems of the Tribe of Ephraim and its rulers.

The lion can seize and subdue, but cannot assist in the cultivation of the land. The Jews have been for ages, celebrated for their grasping tendencies, and for their comparative dislike of agriculture.

The animals which are found on the British arms, illustrate our national history. The unicorn which formed the support of the Scottish arms, was said to fight long with the lion; a contest typifying that between England and Scotland. The conflict ceased, and the forms of these animals were taken, as the heraldic supports of the crown; the first place being given to the lion.

The unicorn of the Authorized Version, or *R'em* of the Hebrew Bible, was long of doubtful identification. It was thought to be a one-horned animal, in accordance with the Vulgate: an error which arose, from the idea of it being taken from Egyptian monuments, where it was represented in profile. But there is every reason to believe that the "*R'em*," was a two-horned, wild ox, which had been long extinct in Palestine, and was known only from description.

A creature with one horn, represents half a nation, such was the unicorn, as the emblem of Scotland before the union. The heraldic supporters of the crown being still retained, typify its

maintenance by the two divisions of the nation. But the glory of the country, is mainly derived from the energy and industry of her people ; who are represented by the bull, or ox with two horns.

A human being whose chief excellencies depend on his resemblance to a prime ox, is the admitted type of an Englishman at home and abroad.

Some men show an actual likeness to the lion, in having shaggy hair about the forehead, stern, daring eyes, and stiff whiskers, which do not hide a grim mouth. Their foreheads, noses, chins and shoulders are broad. They are also like the lion in character, being daring yet magnanimous, as lions are said to be. They are more powerful than agile, less crafty than vigorous ;—which qualities, are accompanied by minds more logical than critical.

Such was the character and appearance of Daniel Webster, who earned in the United States, the nickname of " the Lion of the North."

The tiger (*F. tigris*) is lean, smooth-furred, lanky, agile, full over the eyes, wide-mouthed, slant-eyed with immense muscular power, but less weight of limb than the lion ; yet can do more execution, being superior in activity. It is of a ferocious, savage, revengeful and treacherous disposition. As it seizes its prey its face is lit up with an expression inconceivably horrible. It glories in slaughter for its own sake, even after its hunger is satisfied. The lion is not like this ; although it doubtless owes part of its character for generosity to laziness ; or more exactly speaking ;—the temperament of the lion though more powerful than that of the tiger, is more sluggish and difficult to rouse. Showing the analogy to men of lion-like constitution. Men of the tiger-like constitution on the contrary, by their restlessness as much as by their energy, make themselves notorious. They mostly value human life little, and are willing to sacrifice it, whenever revenge, fancied right, or love of show and power prompt.

Notwithstanding a certain gracefulness of appearance and magnificent demeanour ; they, like the tiger, repel caresses at once. We admire them to a limited extent, but we detest their motives and their actions. They may tolerate those who submit to them, but woe betide an enemy in their power.

Tippoo Sultan took this animal for his ensign, and endeavoured to be like it in character. He was fierce and tiger-like, and his end was worthy of a tiger. He fought desperately to the last.

The leopard (*F. varius*) is a fine animal ; as restless and active, yet smaller than the tiger. Its spots are of two tints ;

dark and fawn-colour ; a combination emblematic of a twofold character, one cunning and treacherous, and the other daring and bold. It is thirsty for blood, but does not care so much for flesh. Like the Mongolian robber tribes, it appears to take delight in slaughter, especially human. The leopard is said to prefer human blood.

The tiger and leopard are surely graceful, elegantly formed and magnificent animals ; but with all their great beauty their aspect is unpleasant. Such is the case with some men ; they are graceful and gifted with great personal attractions ; yet the physiognomist shrinks from their touch, as from an evil spirit.

The leopard in Scripture, is an emblem of the Grecian Empire ; the third of the great kingdoms of the world, mentioned by the prophet Daniel. Its progress was like that of a leopard, bloody and rapid ; but its dominion was short-lived, like most "careers of blood." A rule of this character cannot take deep root in a country, it may destroy, but cannot hold steady possession. Like the leopard it sucks out the blood, and leaves the carcase to putrefy ;—a prey to others.

The chetah or hunting-leopard (*Gueparda jubata*) is a small and elegant species, capable of being a servant to man, as its ferocity, cunning and daring, can be made of use to him. Always wild and savage ; it sometimes finds a master whom it will obey, as long as its thirst for blood can be gratified. It is trained at last not to devour the prey without permission ; like the fierce Kabyles when disciplined and under the guidance of a ruler of a stronger race. The man and brute hunt together. The master on his stately camel, watches the bounding deer, hemmed in, and at last seized. Its throat is bit by the growling brute, which drags it to the camel's feet, leaving a bloody track behind, thick with the deer's and chetah's hair. It is called off its prey ;—the bowels of the deer are dug out, and thrown with its best blood at the assassin's feet.

The Zouave-regiments are as pitiless as the Chetah. Their civilized officers lead them on the foe,—perhaps as helpless as the deer. We have an instance of this in the story of the Cave of Kantara, where those imprisoned therein were slaughtered as they attempted to escape. The treatment of prisoners in the hands of the Kabyles, too often resembles that of the wounded deer in the claws of the chetah. When brought into the presence of the *commandant*, they are frequently put to death for the satisfaction of their captors.

The jaguar (*Leopardus onca*) stalks to the marsh, and crouching down till morning, behind a tall bush, waits until the buffaloes come to drink. When within springing distance, it

puts forth its greatest strength upon a leap, towards a buffalo. Successfully it grasps the back, and tearing at its throat, the crimson stream springs forth. Still the jaguar tears and licks the blood, as the creature flies with fury through the forest glades. At last the buffalo turns back, and rushes to the water's brink, and there falls!

The Caraibs of South America, blow their darts from behind some tree upon the passing traveller. The poisoned arrow pierces his flesh; the burning wound makes him long for water; he cannot stray far, but dies perhaps on the brink of what he hopes will quench his scorching thirst. He is soon stripped by the savages, and thrown on the stream,—a breakfast for the alligators.

The puma (*Leopardus concolor*) of South America, is an active, strong beast, but not so large and powerful as some of the feline tribe. It is cowardly and cunning, but is the ruler of the beasts of prey in the far South of America. Like most cowards it attacks the helpless, but seldom ventures to assault a courageous man. It is called a lion, but is more like a lioness, not having the mane.

In harmony with "a less vigorous fauna," than that in corresponding latitudes of the Old Continent, the Natives of South America have *no* beards.

The puma has little nobleness of disposition, and has less courage for its size, than any of the cat tribe; ostriches and guanacos are its principal prey.

The Republics of South America, affect the airs of Great Nations, but lack the courage and strength, the vigour, nay the noble appearance of the stronger nations of the Old World. Their rule although it may be undisputed by any foreign power, is despised by those who have any manly feeling, as suitable only to "a beardless race."

The lynx is one of the smaller *Carnivora*, and is afraid of man; hares, sheep and young deer are its prey. It does much mischief where it abounds. It is hunted for the sake of its skin, which is valuable in commerce. Its eyes are even more oblique than those of the tiger. Its fur is long and thick, and its ears have a tuft of fur at the top, which makes them appear very long.

The lynx is a type of a shrewd, quick-sighted, "long-eared" class of men, who prey on a community that wishes to get rid of them. They do not openly attack the independent, but get their living by cunning and address; by spying at back-doors, and listening at key-holes. Though poor and shabby in appearance, they yet not unfrequently, leave considerable wealth behind them.

Two species or varieties of the cat are known in the British isles. The wild cat (*Felis catus*) and the domestic cat (*F. maniculata*). The wild cat is as fierce and strong as the tiger, in proportion to its size. Rabbits, young lambs and game are its prey. When excited, it attacks animals much larger than itself with great fury; but is usually watchful, crafty, and generally careful to attack only the weakest animals. Yet when driven up into a corner, it will defend itself desperately.

It has its analogue in some individuals of the Celtic race, who are usually unwilling to work steadily. Such have not the useful qualities of the Lowland peasant, or the English labourer, any more than this tiger in miniature, has of the Scotch colly or English mastiff.

Women sometimes resemble the cat in disposition; the individual we are about to describe, possesses in a greater degree than any one we have met, the qualities of puss.

Her head is wide over the ears, and her eyes are very oblique but of a light colour, which looks somewhat strange with her black hair. She is well formed, slim, muscular and rather graceful. She works pretty briskly, and keeps her house in excellent order. Her person and dress are clean, and she sits much at the fireside. When it is wet she hates going out, unless she can go in a carriage, that her feet may not touch the ground. She is much admired by her female friends who are but slight acquaintances.

She is furious when provoked, and in her younger days was apt to leave the mark of her nails behind her; but this unpleasant habit has been long cured. She is very crafty in her mode of accomplishing ends, but it is said was very "loud" in her courtship. She takes great pleasure in teasing those who are in her power, whose position may be compared with the mouse in the cat's paw. She usually "keeps within the statute" in her misdeeds.

The cat becomes very much attached to places, and to different circumstances or modes of life. These appear to exercise a great influence over it. The cat is unwilling to sacrifice comfort, do much for, or follow those even who are most kind to it; but appears to miss their attentions if withheld. It is incapable of forming a cordial regard, like a dog, even of a surly race. At the same time the cat has a feeling of sympathy, certainly not of an unselfish kind, but still better than no sign of feeling.

We remember a family whose dispositions were of an amiable character; envious and treacherous; kind only in name; liberal only in presence of the clergyman and newspaper reporter. They subscribed to charities, only when much pressed

by the influential, in order to make money go as far as possible, for the purchase of credit and a good name. To those who were even moderately good judges of character, their manner was repulsive ; their shake of the hand, was cold and clammy, like a reptile's touch. They were not altogether unsusceptible of kindness but *love of persons* with them, was like the cat's, mainly founded on love of Place.

The ichneumon although of small size is the most savage creature known, and excites our wonder by its cunning and ferocity. It is more destructive to animal life than many beasts of prey of much larger size, and is not to be despised as an enemy even among the larger animals. The ichneumon (*Viverra ichneumon*), is said to watch the crocodile of the Nile, and when it opens its mouth jumps down its throat and gnaws a passage for itself through the stomach and intestines—a memorable instance (if true) of extraordinary courage and address, overcoming a much greater force. It devours the eggs of the crocodile, which lie buried in the sand, and thus checks the increase of what might be too numerous as a species.

The ichneumon has an analogy to some little boys, possessing enormous courage and cunning, directed to the destruction of property and animal life. When they enter a house, their chief aim seems to be to pull it to pieces. They show great violence, and if not checked the house is soon "Gutted," by these little ichneumons in human shape, and every living animal teased or destroyed. As an example of what human nature is when left to itself, they are instructive. They should be kept in check by those who are stronger than themselves, and their great energy like that of the ichneumon should be directed to the destruction of the more noxious insects.

The weasel (*Mustela vulgaris*) one of the smallest and fiercest of the Carnivora, does not hesitate to attack the rabbit, ten times its weight. It is long-bodied, short-legged, and lizard-like in motion and has a sac from which it discharges when enraged, a most fetid liquid ; polluting what it comes in contact with. It is more useful than hurtful to man ; for it kills by a bite through the brain innumerable mice, and rats ; but this is partly counterbalanced, by the mischief it occasionally commits in pigeon houses and rabbit hutches.

Some persons resemble the weasel in certain qualities ; being active and agile on a small scale. They are malicious and spiteful, and take pleasure in doing personal injury, and are frequently offensive from their capacity for foul abuse, which is however sometimes bestowed on those who from their unpleasant qualities have made themselves generally odious.

It would not be well in the present state of society, for

this class of men to become extinct, notwithstanding their disagreeable properties: they become less numerous as society advances.

The stoat or ermine (*M. erminea*), a graceful little creature, changes its complexion according to season. In summer it is brown-backed, and light-coloured beneath. In winter it is a delicate yellowish-white all over. In summer it runs among the herbage and rocks, and its brown colour renders it less conspicuous. In winter its nearly white appearance makes it little observed on the snow. It can thus approach within a short distance of its prey, without alarming it too soon, or giving it time to escape.

It is a curious fact, that in Britain the stoat only becomes an "ermine" in cold seasons. In mild seasons it is often seen variegated.

Circumstances often alter the external characteristics of men, who may be said "to take their colour" from what surrounds them.

If a man can live through adversity without loss of character it is happy for him; but under trial he frequently supposes that he must assume a different guise, to be changed again in a period of prosperity.

The stoat's form is stouter in winter; but still it is always the same animal,—the tail is always tipped with black.

The most accomplished actor cannot entirely transform himself, he has always personal peculiarities left.

The polecat (*M. putorius*) is a very fierce little animal not to be daunted, or turned back from attacking creatures of a considerable size. It is very destructive to poultry and game, and slaughters without mercy, far more than it can devour. The ferret which is probably an albino variety of the polecat, is trained to enter muzzled the holes of rabbits, and drive them out into nets, spread at the mouths of the holes. Were it not muzzled it would get drunk on the blood of the rabbits, and remain in the hole.

Like the subtle detective of doubtful reputation, it appears to take extraordinary pleasure in driving creatures into the snare.

Detectives and ferrets require to be treated with caution. It should always be borne in mind what they are. The difference between some detectives, and some malefactors, is principally that the first are working for the benefit of the public, and the second on their own account. Men, who are the most familiar with the criminal classes, are those best able to hunt them out and drive them into the meshes of the law, having a low moral organization themselves. Yet they cannot be trusted with-

out a close surveillance. For the "reward of blood" they are willing to enter the "lowest holes," and drive into traps those who prey on the fruits of industry. That they are exceedingly useful cannot be denied; but we despise them. Like ferrets they are never allowed to drink when on duty; but when their prey is captured they often exceed.

Evil instruments are made for evil work; those who are "clean" are not fit for what is impure; and evil agencies are employed in punishing those, whom good ones cannot so well reach. The pure do not always understand evil, so well as to be able to deal with it.

The polecat is a ferret in a wild state, and is hunted down and destroyed unmercifully, merely because it directs its powers of destruction against valuable property. Were it to destroy the rats and mice only, it would take rank with the domestic cat.

The skunk (*Mephitis americana*) is a little animal chiefly remarkable for the fearful odour it exhales, which is more unpleasant than that of the badger, weasel or polecat. Yet it is eaten by some Indian tribes. This circumstance reminds us of those who though "dying in an odour of sanctity" among certain persons; yet by others, were considered during life, as being in the depths of depravity. The religious rites of some savages though viewed as acts of piety amongst themselves, excite horror in the civilized man.

The glutton or wolverine (*Gulo luscus*), is a great enemy of the beaver. It likewise attacks larger animals, which are disabled from defending themselves by disease or accident. It is peculiar to the Polar regions of Asia and America, and is notorious for the cunning with which it destroys the traps of the hunter. Its fur is prized in civilized countries, but still more in the desolate regions of Kamschatka, where the women dress their hair with its paws. This is appropriate to a savage and brutal race, gluttonous of animal food, cunning, and not to be easily entrapped.

The glutton, unlike many other animals gets blacker as the cold advances. It is also in part true, that the colder the climate, the darker the human inhabitants, throughout the Arctic regions of Asia and America.

The otter (*Lutra vulgaris*) is called the "aquatic polecat," and it is certainly allied to the weasel family. It is ravenous for fish, and is exceedingly destructive in our preserves; catching and destroying, far more than it can devour. Its lair is often found strewn with spoils, and is visited by hooded crows, and sea gulls, who banquet there on what it leaves. The otter can be trained to catch and bring fish to its master's feet.

The otter displays a strong analogy with those fishers, who long pirated in the Northern Ocean, and on whose leavings so many smaller tribes came to feast, but who now work for the general good. Such were the Scandinavians; once the terror of the "Four Seas;" and late the Glory of the West.

The morning Eastern sun has shed its brightness; its lucid ray was purest; the noonday sun was hottest, falling most equally on all. But now the Day is passing; all the light comes from the West:—it is a gorgeous light. Rich and varied tints shroud the close of day. The reflection of these colours fills a great arch. Are they too bright to last? and will a gloom pervade the Western horizon? The sun will rise again and overshadow the East, with purer and whiter rays than it ever shed before. This will be followed by an unclouded day!

Christianity is the only form of religion which can stand in an enlightened East. Is it not through the prism? a trinity, that we gain our knowledge of the Elements of light? or of those colours which compose the light of the sun?

Even now when "we look through a glass darkly," we see the primary colours,—Blue, Yellow and Red; which typify the three accompaniments of an Everlasting kingdom, **CONSTANCY, GLORY and POWER.**

The gold and blue in union yield refreshing green, which suits repose, that cannot fade, that ever flourishes. The blue and red unite, to form the purple Ruling Power. The red and yellow compose orange; which illustrates knowledge, **THE FOUNDATION OF POWER AND GLORY.**

CHAPTER XI.

THE RESEMBLANCE BETWEEN MAN AND ANIMALS.—*Continued.*

BEARS—SEALS—WALRUS—SQUIRREL—DORMOUSE—FLYING-SQUIRREL—MARMOT
 —AGOUTI—PORCUPINE—CHINCHILLA—BEAVER—JERBOA—LEMMING—RATS
 —MICE—WATER-RAT—SHREW—MUSK-RAT—HEDGEHOG—MOLE—HARE—
 RABBIT—RACCOON—COATIS—CIVET—CATTLE—BISON—MUSK-OX—GOLDEN-
 CALF—SHEEP—GOAT—CAMEL—LAMA—HORSE—HIS TEMPERAMENTS—
 THOSE OF PLANTS AND FRUITS—BREEDS OF HORSES—THE HISTORY OF THE
 HORSE—ASS—MULE—TAPIR—CONEY.

THE polar bear (*Ursus maritimus*), the largest and most powerful of its tribe, preys on fish, seals or the carcasses of whales, or of any animals that fall within its reach, but it sometimes ventures to attack the huge and unwieldy walrus.

The Russian power is popularly illustrated by a bear, whose character truly exemplifies that of the great empire. Various species of bears may represent Russian influence in different localities. As the polar bear tyrannizes over the seals; so does the Russian government over the feebler Hyperborean nations; which it sometimes endeavours to drive from their fishing grounds in the Arctic seas.

The brown bear (*Ursus arctus*) is a type of the diplomatic representative of Russia in most parts of Europe, who notwithstanding his artificial polish in public; in private life is still "a bear." The Russians and the brown bears, are particularly abundant in Poland where they excite much terror. The Russians and their animal representatives, are much less feared than they used to be on the continent of Europe; but in England they are known only as rare visitors.

The bear is a very intelligent creature, but its intelligence is not so great as its strength; such is the character of Russian influence, which is awkward, powerful and massive, rude and clumsy; yet most crafty.

The black bear of America (*Ursus americanus*), typifies Russian influence in that country, which extends even to the more Southern of the United States.

The Russians in Russian America, being not so much influenced by the civilization of Europe, as those in less remote

regions, may be compared with the grizzly bear (*Ursus ferox*) of the northern portion of the rocky mountains.

Surprise has often been expressed that the Yankees, notwithstanding their boasted liberal institutions, have for many years courted the friendship of Russia, a power pre-eminently representing brute force. This is not so inconsistent as has been often supposed; for Democracies are pre-eminent for their rude tyranny. Russia has of late thrown herself into the arms of the "grizzly bear," by selling her American possessions to the Yankees.

As we advance towards the South, the very species of bear even is not changed; the same savage, grizzly animal, being alike found in Russian America and the United States; and also in British territory.

Men showing a resemblance to bears, are found in many countries. They are stout in the body, wide in the head, and immensely powerful in limbs; yet are awkward in their way of sitting down. They possess a small fierce eye, and should not be trifled with. Their uncouth manners are accompanied by the use of coarse language, but voluble abuse is not characteristic of them; for they are more inclined to display their anger by blows than words. In general they show little kindly feeling or generosity, and are courageous, but are also greedy, gluttonous and cruel. Fondness for their children is usually the only amiable trait they display. Their ears are commonly very large and stick out. Their hair is very thick, pretty long and very dark, but not curly. They are cunning and not easily conquered; for they can make a desperate resistance.

We once saw a French subject, of mingled Polish and Turkish descent, who had just this physiognomy and character. He was usually considered most unamiable; but ventured his life to save his children, upset from a boat, on the ice on one of the Swiss lakes. He succeeded in extricating them from their perilous position, but one died, in consequence of a fever brought on by the wetting. He mourned for a considerable time, evidently feeling the loss acutely; but it had not a subduing influence on his morose and savage spirit. Like "a bear robbed of her whelps," he went round the village, vowing vengeance against the man who had upset the boat;—a case of pure accident, caused by one of the sudden squalls, which are so frequent on Alpine lakes.

The seals are an important and interesting genus, of great value in commerce, feeding entirely on fish. Being mild in disposition, yet sufficiently strong to defend themselves against those enemies they usually encounter in their native seas, their

lives, but for man, would be particularly smooth. They are amphibious, but are more at home on the water than on land.

They are pursued on account of their skins and for the abundance of their fat, and are unceremoniously knocked on the head and stripped. When tamed they become attached to their masters, and are amusing creatures. When they first encountered the civilized man, they showed no fear, but now they must be hunted by torch-light and with fire-arms, and it is to be feared that in a few years they will be nearly extirpated.

The inhabitants of many of the islands of Polynesia, spend much of their time in the water, like seals, and come ashore at night. Like those animals they are stout in the body, and live principally on fish. The natives of many of the islands of the vast Pacific, showed no fear when they first had intercourse with Europeans. But their courageous simplicity was in some cases sadly betrayed. They, like the poor seals were severely beaten, and perhaps stripped of their property. They gradually became more shy of those who treated them so badly; but still showed great difficulty in believing ill-will. Good natured and happy, they enjoy the present moment; the past is little cared for, and the future still less.

In some cases we fear they may be extirpated. Our friends the sealers, will then be no more welcomed by their swarthy faces; or by their presents of yams and sweet potatoes, to be exchanged for nails and buttons. Folly and cruelty capable of occasioning this, may be compared with that of the man in the fable, who "killed the goose that laid the golden eggs."

The South Sea seals, have their prototypes in the populations of the island groups, who differ as much in character, as the various species of seals. There are sea-lions and sea-leopards, as well as sea-goats and sea-calves. The sea-lions fight desperately among themselves, and are a terror to all smaller animals.

These have their analogues in the Maories of New Zealand, who feared not the whalers, but devoured many a European, shipwrecked on their coast.

The sea-lions with their great teeth, have mangled many a human skull. Such are formidable indeed; all the little seals flee as they draw near.

The Maories, "the Lions" of the South Sea, are like the "British Lion" in individual power. It may extirpate them, but only with the loss of much of its own blood; for a conflict with them is serious. They have a similar relation to other Polynesian tribes, as the sea-lions have with the smaller seals. They conquered the Polynesians they came in contact with, but never CONQUERED THEMSELVES.

A more powerful nation at last landed on their shores. The lion of the north has greater grasping powers than the sea-lion; and in like manner the British race retains its possessions more tenaciously than the Maori. "The Lion" has *sharp claws* for its enemies, but a *cushioned paw* for its friends. The Maories must choose which paw they will have.

The common seal (*Phoca vitulina*) is mild compared with the sea-lion or the sea-leopard, but yet preys on the northern fish. It is good-natured, and can be tamed even to catch fish for those who keep it. It manifests more intelligence than we should expect from a seal. Its skin is thick, it is stout in the trunk and yields much oil. It is gregarious but inoffensive to man.

The Greenlanders who also inhabit an Arctic country, resemble this seal in their love of fish and mild disposition. They are not usually considered to have much intelligence, but they show qualities eminently suited to the climate and surroundings of the region in which they reside.

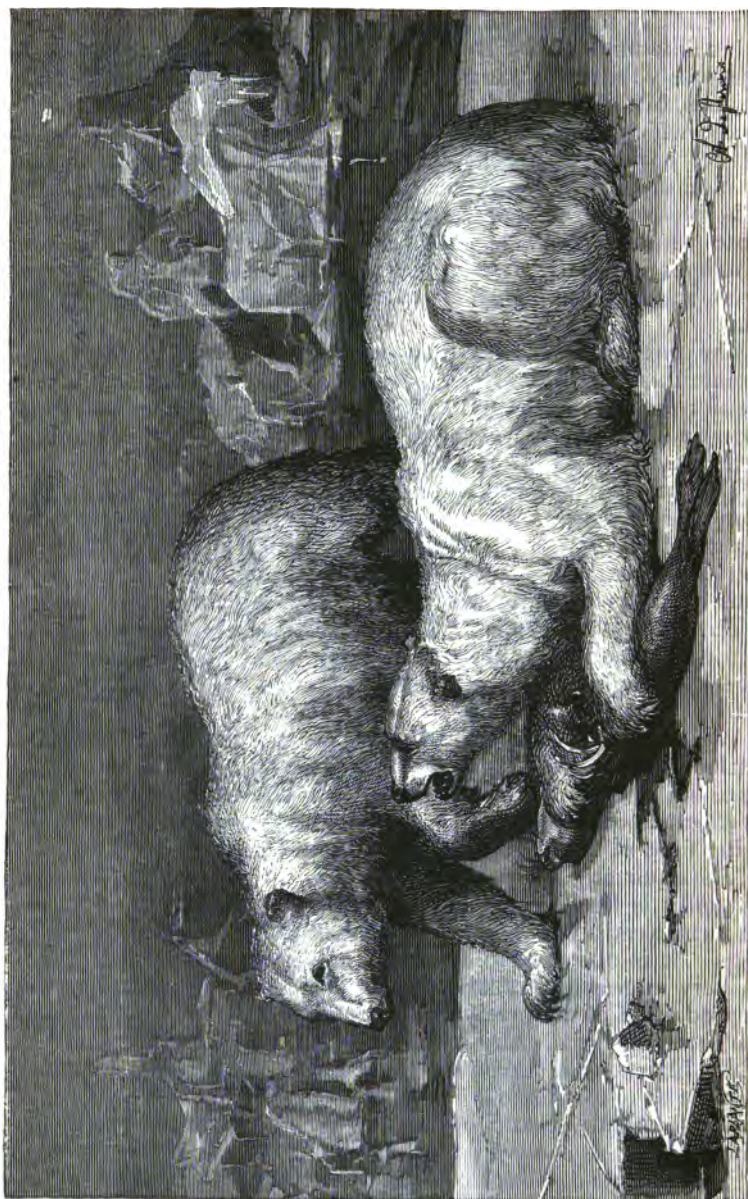
The seals in general, typify the maritime divisions of the Mongolic race. The Maories are thought by some Ethnologists, to exhibit traces of "Caucasian" (Semitic-European) descent, and their characters are thus illustrated by those of the sea-lions, who show affinity with animals of a higher order.

The walrus (*Trichechus rosmarus*) is allied to the seals, but is so much larger and grander a creature, that we are inclined to give it a higher place. Its food consists of fish and marine plants.

We think that the walrus typifies the Scandinavian race settled in the Arctic regions, which is so vastly superior to the Laps or Esquimaux, both in physical stature and moral and intellectual capacity. They adopt a less exclusively fish diet, being fond of a due proportion of vegetables.

The squirrel (*Sciurus vulgaris*) like several other species of its genus is lively, playful and exceedingly graceful. It feeds on nuts, bark of trees, grain and occasionally beetles and bird's eggs. It is not therefore so innocent as is often supposed, but so very interesting in habits, that we are inclined to excuse the depredations of the lovely little creature which so much enlivens our woodland glades by its agile sports. It can bite severely when liberties are taken with it, but not in the same ferocious manner as a carnivorous animal. It is covered with soft fur of a rich foxy brown, and has a long bushy tail which waves behind; the teeth are yellow; but the eyes are bright and pretty.

The squirrel has its analogue in a sportive, thoughtless girl, active and sprightly, graceful but graceless;—the delight of a pic-nic party. She has like the squirrel, red-brown hair and



WHITE BEARS DEVOURING A SEAL.

yellow teeth ; and like it is fond of nuts and *bonbons*. In our sportive moods we like the society of this pretty maiden, but she has so little in her character that we can respect, that in our serious moments we treat her coldly. It is not always safe to trifle with her, for she utters biting speeches when they are least expected.

The nest that the squirrel builds for its young, is called its "drey," which is particularly comfortable and usually far out of the reach of snakes, cats and other enemies. In the autumn it hoards many nuts and other articles of food, and thus a wise provision is made for the future.

Many a sportive girl, in her married life shows a comfortable house well stored with luxuries, and far out of the reach of her less fortunate companions ; whose passions fed on envy, would gladly bring her down from her Elevation ; but she wisely distrusting their Machinations, has placed herself out of the reach of their venom. With all her sportiveness, she has a strong "instinct of self-preservation."

The dormouse (*Myoxus avellanarius*) is a very small creature, comparatively innocent, yet in its choice of food sometimes less careful than the squirrel. It eats much grain, for which it is disliked by the farmer in districts where it is abundant. It seldom like the squirrel ascends lofty trees, but loves to dwell among the low herbage, or on the grassy bank. It builds a nest of fine woven grass, like that of one of the warblers amongst birds ; and the entrance is sometimes so small and neatly finished, that the little creature as it goes in, pushes away the elastic grass, which closes round, and the hole is hardly perceived ; thus it is warm and snug. It lays up a store of seeds and fruits at the end of autumn, and becoming very stout, retires to its nest and sleeps during the cold weather. But when the south wind blows wakes and eats ; then sleeps again, until as the leaves open it springs from its nest,—as the peasant does in Russia and some Northern countries, when the seed-time comes. He lives in the cold weather on what he saves in summer and autumn, for in the winter most outdoor work is suspended :—he then retires to his snug cottage.

The flying squirrel of America (*Sciuropterus volucella*) is a link in nature connecting two orders of quadrupeds, the bats and the rodents. It is wonderfully quick and agile in its movements, and is enabled to set the ordinary laws of locomotion in quadrupeds at defiance. Its gambols are much more violent than those of our common squirrel, between which and a certain class of English young ladies we drew an analogy. We now carry the comparison across the Atlantic.

The flying squirrel which is more erratic than the common

species, we consider illustrates the Yankee girls, who exceed in their "fast flights," the girls of British birth. The English girl can kill time by jumps; the Yankee girl by flights. Those who would run after either, must remember the diverse habits of the game.

The flying squirrels are quite as attractive as the British species, but are not so easily tamed. They are more short-lived,—in captivity at least.

The marmot (*Arctomys marmota*) does not lay up stores of food like squirrels and dormice, but its fat is its sole support as it lies in its burrow, when the winter frosts make the earth chilly. It is a sullen, obstinate animal common in the more elevated districts of Savoy and the Pyrenees.

The human inhabitants of those districts are diminutive, and have a good deal of the dogged simplicity of the marmot. They retire to their villages, hid in the deep trenches between the mountains, during the coldest of the weather, while the valleys are blocked up with snow.

In foreign countries the marmot is often the companion of the wandering Savoyard, who begs his bread; and as an excuse exhibits one of these animals:—it is thus a national emblem.

The agouti (*Dasyprocta agouti*) allied to the guinea-pig, is a mild, gentle creature, with little energy or power. Although prolific, it does not reach the amazing fecundity of the guinea-pig. It has been nearly extirpated in some localities.

The agoutis resemble some of the native tribes of the countries they inhabit, such as the aborigines of St. Domingo, whom the Spaniards destroyed. We lament the extinction of any race of Man, and regret the extirpation of any species of animals; yet we must allow that some of the sensuous Indian tribes of the tropical Western world, occupied a place amongst mankind, no higher than the agouti does among the Rodents.

The crested porcupine (*Histrix cristata*) has not the grace and beauty of some animals, yet is so curious in structure, and interesting in habits, that we are inclined to give it a prominent place in our typical review of quadrupeds.

It is indisposed to attack large animals, but can make a formidable defence, even against the more powerful beasts of prey. It is comparatively defenceless in front, but is well armed behind, and in this quarter is a match for its enemies.

It is not formidable in teeth and claws, but mainly relies on its quills, which it erects, and placing its head and feet beneath them, awaits the approach of the foe. Even the lion and tiger generally shrink from attacking it, if on its guard. It is equally wary with those animals that are not carnivorous; but seldom attacks any without provocation; unless for food.

Some human beings resemble the porcupine in character. They are not aggressive or inclined to mischief; but when driven into a corner, they lower their heads and begin to ply their quill pens, which are exceedingly wounding, and sometimes even produce incurable sores. All men feel their wounds, except those who are as little sensitive to sarcasm, as the rhinoceros and alligator would be to the attacks of the porcupine.

We value the quills of the porcupine for ornamental purposes, as they display well in *black* and *white*. Writers of the character to which we have just referred, are frequently the ornaments of an age, for they have the power of depicting in varied colours, which enlivens and illustrates their works.

The chinchilla (*C. lanigera*) whose pretty fur we so much admire, is a harmless, gentle, little beast, and resembles the squirrel or the dormouse in shape. It inhabits the Alpine valleys of Chili, and its fur is a valuable article of commerce. Docile creatures are the most generally useful to man, and these chinchillas, although not domestic animals, from their simplicity and innocence are generally favourites.

The weaker amongst men are always the prey of the stronger, especially when they have valuable property. It is not always necessary to convict them of being injurious to society, in a South American Republic like Chili. If they possess what others want, and cannot defend their rights, they are very apt to be made martyrs thereto;—like the chinchilla.

The beaver (*Castor fiber*) is one of the largest of rodents, and is in many respects one of the most remarkable of quadrupeds. If we can credit what is said of their habits by naturalists, they should be placed at the head of their order. The extraordinary dams they construct, their curious circular habitations, some of which are divided into compartments, the manner in which they fell trees; and their great perseverance in all their undertakings, astonish us. They adapt the character of their dwellings to their locality; for sometimes they are not at the pains to construct the elaborate dwellings above described, but content themselves with a burrow on the banks of a stream, like that of a water rat.

Their affection for each other is said to be remarkable; and the manner in which they combine, to construct a dam to keep water round the aquatic lilies (*Nuphar luteum*), and other plants on which they feed, reminds us of the united labour of human beings for mutual benefit.

The beaver is a shy and gentle animal, fleeing from the haunts of men. It was once a native of these Isles, and other countries of Europe, and was not extirpated in Great Britain until after the 12th century. Like the human abo-

original inhabitants of many countries, it has been subdued and driven away by those larger, fiercer and stronger than itself. The beaver always had a great enemy in the wolverene or glutton (*Gulo luscus*), which however could not extirpate it. Civilized man is the Powerful enemy, before whom the beaver must perish or retire.

Where are now the tribes that executed the simple works and manufactures, of which we have in many countries a few relics? They have passed away, having but little place in a civilized land,—like the beaver and its dams and mud-huts; yet still their interesting ways, make the more sentimental among us regret them.

Such were the human populations, who are believed to have dwelt on the Swiss lakes, at a period anterior to that of the Celts. They were probably a mechanical race, whose monuments dimly shadow out their being, through the gloom of the past.

The jerboa (*Dipus ægypticus*) lives in its burrows all day and comes abroad when the cold dews fall: it can jump enormous distances. The flesh is unpalatable to Europeans, but is eaten by the Arabs.

The jerboas typify the Copts, who with them inhabit Egypt. The Copts "can make good use of their legs when pursued," and were long the prey of Arab conquerors.

The lemming (*Mus lemmus*) is omnivorous, eating the scanty produce which the short summer yields to the inhabitants of the North of Europe. It is thus one of its "scourges," and takes the same place as a destroyer, as do the locusts of the South. When the lemmings have exhausted the vegetable produce in their neighbourhood, they eat each other.

The lemmings which desolate Norway and Sweden, have their home in the more northern country of Lapland. They may be compared with those Northern nations, so much dreaded by the inhabitants of the South, who likened them to swarms of rats and other omnivorous animals. For after having desolated and consumed the choicest productions of a country, they turned their rage against each other.

The black rat (*Mus rattus*) formerly did much mischief, and was, compared with the mice a powerful animal. Like the Celtic nations, it is said to have come from the East; and long it flourished in its Western home. At last a lighter-coloured rat of greater weight and size came, called the "Norway" or brown rat (*Mus decumanus*, Pallas), and visited France, England and Germany; it subdued or drove away the black rat.

The Normans conquered or displaced, the previous populations of many parts of Europe, as in the North of France,

Sicily and England. They have lighter hair than the Celts generally ; being a brown,—rather than a black-haired people.

The short-tailed field-mouse (*Lemmus arvalis*) is our most destructive mouse, as it increases rapidly and destroys much corn, the bark of trees, and other of our crops. The trees that are barked by this creature are soon destroyed.

We cannot entirely extirpate these mice ; in common with some of those classes in human society which prey upon our industry ; but we can lessen their numbers by the use of dogs, cats and traps ; which have their equivalents in Military, Police and Gaols.

The domestic mouse (*Mus musculus*) is as annoying to the housekeeper, as the field-mouse is to the agriculturist. It tunnels our walls, gnaws our furniture, and everywhere messes and defiles our property, leaving a rank smell. In this it resembles some of the young of our species, who are fond of boring holes in furniture and walls, and who soil and stain what they touch.

The water-rat (*Arvicola aquatica*, Flem.) like the dormouse and squirrel, stores up provisions for the winter, sometimes collecting a gallon of potatoes or roots in its deep burrow. It does much mischief where it abounds in our fields and gardens, being strictly frugivorous.

It may be compared with garden thieves amongst a village population, who like the water-rat, often root up, destroy and hide, more than they can dispose of.

The shrew (*Sorex*) lives entirely upon insects, which it destroys in great numbers. As it is very numerous in many districts, it thus does much good in removing noxious species. Amongst the ignorant and superstitious, it gets the credit of doing harm to cattle, and was the subject of invective and incantation in times past. It has a peculiar pungent odour, disagreeable to many persons, which proceeds from a gland near the tail, containing a substance more or less poisonous. It is exceedingly pugnacious, and when two shrews meet, a battle is likely to ensue.

These animals have their acknowledged analogues in a particular class of housewives, who are sharp and orderly, and as they kill all the beetles and flies they meet with are of much service in a house ; but we do not like to come near them. Like the shrew-mouse they have sharp noses, and are fond of poking into dirty corners. When two women—"shrews" meet, they sometimes show their spiteful characters in mutual attacks. They should not however be persecuted as a class, for their sharp noses, can scent out what others cannot, and their houses are not unpleasant to enter when the "shrew" is not at home.

The-musk rat of Russia is a curious creature, which shows an analogy to the shrews and the duck-bill platypus. It possesses a gland containing a substance which has an odour inferior to but somewhat resembling musk. Its skin is useful to put amongst furs and other clothes, as the odour it exhales is avoided by insects. This pungent smell frequently assists its escape from attacks or injury, for many creatures avoid it, and those who kill it, often refuse to eat it.

These animals resemble those amongst human beings, whose disagreeable and disgusting qualities preserve them from being "the prey of the stronger." When our premises are scaled by unclean beggars, we order them away, but we do not like to "lay hands on them" ourselves.

The hedgehog (*Erinaceus europæus*) has been unjustly maligned, having been accused of much that it cannot do. It is in reality a valuable animal from an economic point of view, for it destroys multitudes of insects, vipers and other reptiles; cockroaches and beetles. It is slow in motion, and were it not so thickly covered with spines, would be a victim to every large nocturnal beast of prey.

When it fears danger, it withdraws its head and feet beneath its spiny covering, which it closes round it like a mantle. In this state many a fierce dog hesitates to attack it, and it can be rolled or kicked about with little injury. If it has little power of making an attack, it can like the porcupine make an effectual defence:—Men of this character exist in society.

The hedgehog, so useful in ridding us of vermin, finds its analogy in the smaller fry of "the press," so useful in strangling our local abuses; but who are easily attacked themselves; unless like the hedgehog they keep within what is specially afforded for their protection. "THE LIBEL LAW IS THE SHIELD OF THE PRESS." Keep within it and you may wound with impunity.

The mole (*Talpa europæa*) is one of the most industrious of little quadrupeds, and its structure is perfectly adapted to its habits. It has a close, dense fur, that scarcely anything will soil, or any dirt penetrate; eyes that are susceptible of light, but incapable of sight. It has no external ears, but yet its hearing is wonderfully acute. Its nose is very long and flexible, on which it depends more than on any other organ for its knowledge of objects. Its fore feet have a superficial resemblance to the human hand, and have enormous scooping powers. The mole can progress through the earth at an amazingly fast rate; faster than it can on a flat surface.

In pursuit of its prey it forms galleries, which wind beneath the soil to a great length, but they also answer as its place of

residence. Its enemies find great difficulty in following it, through those narrow and tortuous passages, which it blocks up at the entrance by a heap of finely-divided soil. Its foes are numerous and belong to various classes, the most formidable is man: but dogs, cats, weasels, hawks and owls likewise lessen its numbers.

The value of the mole to the farmer, is variously estimated by different naturalists, and doubtless greatly depends on the character of the locality it inhabits. Its food consists of earth-worms and insects, never of agricultural produce. In Alpine pastures we should think it is very beneficial, by ventilating the soil, bringing fresh earth to the surface, and destroying multitudes of grubs. But it is sound economy to lessen their numbers in highly cultivated districts, where their incessant burrowing and heaving up of the fine soil, disorders our plantations and choice meadow land. We are no advocates for the extirpation of moles. We consider them types of those artisans, whose labours are only suited to an uncivilized state of society, and are hurtful to one of high culture.

The lowest sections of the agricultural populations, like the mole, grovel in the soil, and are the companions of earth worms in life as in death. Such are being displaced like the mole, by "the march of agricultural science."

Moles possess qualities which are shown in few animals to so great an extent, and not many follow their prey with equal perseverance and success. The sense of sight is imperfectly developed, but the extreme acuteness of their other senses, more than compensates for its deficiency in a creature that passes so much of its time in the gloom. Human beings of the character to which we have above referred, perform those offices which immediately concern their daily routine of duties with great success; but like the mole they are "blind" to what is in the least degree beyond "their humble sphere."

The common hare (*Lepus timidus*) is a mild, gentle creature, easily frightened as its Latin name implies. It subsists entirely on plants. It is so swift of foot, and so quick of hearing, that were it not for its feeble intelligence, it would in most cases defy pursuit. After being followed by the hunters and dogs, it generally returns to the spot from which it originally started;—a habit which Goldsmith beautifully uses to illustrate the wish the wanderer has "to die at home."

Hares are excessively destructive to farmers' crops, and were they not extremely valuable for sport and food, would long since have been extirpated.

There are mild and gentle persons among us who resemble hares. They have commonly "long ears," and although "not

asses," yet are ready to listen to almost any speaker. They have ill-balanced minds, and take alarm at the veriest trifle. Their mildness should however lead us to treat them with more consideration, than some of the acute and courageous are inclined to do. Such weak persons are apt to be the prey of "sporting characters," who would not wish to extirpate them, but who like to worry them. "Great Villiers," was said to



THE HARVEST MOUSE (*MUS MESSORIUS*, SHAW) AND ITS NEST. Page 293.

value most of all "a fool to laugh at," and he was one of the greatest "sportsmen" of his day.

No greater evil could befall a country, than to be overrun by "harebrained" men; although we pity them, yet we feel they ought to be KEPT DOWN. They have not spirit or energy to leave the spot where they are persecuted, but return like the chased hare. This is particularly the case when they attempt argument; it may be long, but generally ends in a *safe* arrival

at the *starting-point*; and when *hard-pressed*, they know how to “shift their ground.”

The rabbit (*Lepus cuniculus*) is a more prolific and abundant animal than the hare, and is suitably protected in a burrow, which the more fully developed and active hare does not require. —The rabbit is blind and helpless at birth, but the hare can run almost as soon as it is born. It is not so timid as the hare, being apparently conscious that it has a place of safety at hand, to retire to at the last moment. It is more frolicsome and lively, and more inclined to be familiar with us, we therefore



A HEDGEHOG AND FAMILY.

Page 294.

like it better, and can more easily reduce it to a domestic state than the hare. When it is wild we hunt it; when it is tame we pet it. The rabbit has little intelligence, but increases with amazing rapidity.

Persons who being very fertile stay much indoors, have offspring who are prone to be feeble, and resemble rabbits in character, rather than elephants or lions.

The changing hare (*Lepus variabilis*) is much more easily tamed, and is more frolicsome and pleasing in its manners, than the common hare. As the seasons vary, so does the

colour of this species. In Britain it is only found in the more northern parts.

The common hare being found in the lowland districts of England, may typify the timid amongst the English: and the changing hare which alters its coat according to season, may illustrate a similar class among the Scotch, who though they escape some dangers, yet may earn from their double character, the nickname of "turncoat."

The racoon (*Procyon lotor*) reminds us of the fox, the cat, and the badger, and partakes of many of the points of character of each. It is cunning, treacherous and ill-tempered, but kind treatment has a greater influence upon it than upon the fox. The racoon is rather wanting in courage in attacking animals of its own size, and is easily cowed. It can never be perfectly tamed, but the first opportunity always returns to its wild habits. It is given to robbing hen-roosts, and is exceedingly destructive to the smaller domestic animals of the farm.

The character of the racoon is sometimes exemplified in human society. The following anecdote of a gipsy boy, well illustrates this animal's disposition.

The lad was caught one night by a lady's servant in the fowl-house, in the act of killing a fine Cochin China hen. The lady handed him over to the police, and after some weeks' imprisonment he was sent to a Reformatory, and having for the last six months of his residence there behaved well, the lady was induced to take him into her establishment as stable-boy. For three months he did his duties, but on some of his tribe coming into the neighbourhood, he made off to them stealing a pig. This being a valuable animal, a reward of £5 was offered for its recovery, and one of the tribe gave evidence against the boy, who had five years' penal servitude.

Many gipsies have been taken much trouble with, and petted like this boy by foolish people; but they mostly display so low a moral organization, that there is little hope for their being useful members of society, unless under a high degree of restraint. Whenever the pressure is removed, they show their native wildness.

The coatis (*Nasua fusca*) is a fierce, active brute related at once to weasel, lemur and bear. It is one of those untameable creatures which no kindness or harshness can subdue. It will eat, or at least bite anything it comes near, and with its intensely sharp teeth, it can inflict most painful wounds. Its voice is a shrill squeak, when once heard not easily forgotten. It is a native of Paraguay.

The human inhabitants of this region, are low in credit and in morals. The population, consisting principally of Indians

with a small portion of white, and a considerable share of Negro blood, is much mixed, and the compound races Mestizoes, Mulattoes, Zamboes and Chinos, are suitably typified by an animal like the Coatis, possessing the qualities and appearance of such widely diverse genera.

Their government combines the ferocity and rudeness of the "Russian bear," with the religious bigotry of the Spaniard; which grasps as tightly the throat of the expiring utterer of truth, as does the relentless weasel that of the rabbit. The small, squeaky voice of the coatis, is representative of a most insignificant power, with a miserable tyrant for a President.

The civet (*Viverra civetta*) secretes a substance considered a delicious perfume by some persons, but reviled as an awful stench by others. When greatly diluted, and mixed with a variety of ingredients it is agreeable, but is not generally liked unless so modified. Pope says of ambergris

"In heaps a stink it lies,
But well diffused, is incense to the skies."

And what is true of ambergris according to him, is true of riches. Wealth in itself, unless judiciously distributed, may be as loathsome as concentrated civet. Those who are gifted with it, may like this animal be a means of benefiting an extended circle.

The civet, like the natives of the north of Africa where it is found, is exceedingly treacherous, and hastily avenges the slightest injury.

The common domestic cattle, attend man in all civilized countries, and vary considerably in size and style with climate and circumstances. They differ greatly in courage and in the size of their horns, which however are not a sure indication of the amount of physical force they possess.

We have observed a very curious resemblance in character, between the breeds of cattle, and the human inhabitants of the countries where they reside. Thus the Spanish bulls are the most excitable and easily provoked to gore, the most jealous and revengeful amongst cattle; as their masters are amongst nations. The least question with regard to females, is sufficient to make both Spaniards and Spanish bulls, ready "to bore a hole" in you.

French cattle have very powerful horns, which as the admitted emblems of power, may typify a strong government. The average weight of the French cattle is not equal to that of the English breed; neither do the French equal Englishmen in gravity. We have like our cattle, more powerful physical constitutions than the French.

Our bulls are much larger than those of Germany, and have more courage and strength. They are difficult to rouse but have enormous strength, density and solidity and are rather heavy in their motions.

The Englishman was by Swift called "John Bull." This nickname has been felt to be so appropriate, that it has adhered to him, and become his acknowledged patronymic at home and abroad. Names of this sort do not come to be applied permanently, without some true resemblance. John Bull is depicted and described, as a stout agriculturist; broad-faced, broad-headed, large-eyed, large-paunched; with a gruff, powerful voice, rising into a fearful roar when provoked; but having much good-nature he generally goes on pretty quietly. His demands are great, and as he eats well, he gets very fat in middle life. He is clean and orderly, powerful and slow, rather than quick and elegant, but as he seldom puts his foot back when he has once put it forward; he gets on "in the long run," better than his more agile neighbours.

The British cattle consist of several breeds, all doubtless derived at a remote period from the same stock, but having now acquired different qualities. The "Devon" or long-horned breed, is of the same colour as the red-loam over which it frequently walks. It is a good breed like the people generally in Devonshire. The Durham ox is a powerful energetic breed like those who rear it. The Ayrshire cow is a most profitable one, and economical to keep, like its masters the Lowland Scotch. The Highland black-cattle and the Welsh and Breton breeds, possess great hardiness, which is especially necessary in their haunts; but they are not entitled to so high a place from an economic point of view, as the more Lowland breeds.

The human inhabitants of the Scottish and Welsh Highlands and the remote parts of Brittany, although eminently adapted for their native localities, yet appear out of their element in the rich alluvial meadows of the South. We cannot place any of these breeds of cattle in comparison with those of Ayrshire, Durham or Devonshire, neither can we compare the pure Highland, Welsh and Breton tribes with the Scandinavians.

The Portuguese kine although small, delicate and pretty creatures, show evidence of being of a degenerate breed. Were they once great bulls and cows? and are their masters the descendants of the contemporaries of Vasco de Gama?

The Brahmin bulls are mild and inoffensive in general; but can be roused to fits of rage and desperation, like their masters the high caste Hindoos, who like the rest of their race, are usually so docile.

The bison (*Bison americanus*), an animal of a medium climate,

roams to the North in summer, and to the South in winter. They go in vast herds, and are often induced to throw themselves over precipices by the blinding influence of terror; which acting in the first instance perhaps only on one of their number, may induce a whole herd to follow and perish.

They show an analogy with the Indians of the Mexican prairies they inhabit, who often "throw their lives away," to follow some reckless leader, who has persuaded them that the government is their enemy.

The Indian will probably become extinct as civilization advances. Man thus usurps the place of Man; and beast of beast. A higher life must succeed a lower. This progress is not confined to America but is general, wherever nations or inferior animals, come in contact with superior races or more powerful species of allied types. Thus the buffalo gives place to the European ox! The wild goat to the sheep! The native dog of South America to the European! The rats as well as the native dogs of New Zealand, have been subdued by the European emigrants of their respective classes. The same is said to be the case with regard to the native breeds of fowls in Africa, as having become scarce in presence of the European varieties. Finally it has been remarked that the Eastern species of cockroach (*Blatta orientalis*), becomes more numerous in Europe, as the smaller aboriginal species becomes less so.

The buffalo of South Africa (*Bos caffer*) a gigantic beast, the most powerful of the *Bos* genus, can with difficulty be killed by the lion, and sometimes slays him. The lion by superior sagacity, in general gets the better of the buffalo, in the end, which is notwithstanding a much larger and heavier animal than himself. Yet the lion in order to conquer, must be familiar with the habits of the buffalo, which is an intelligent though ferocious brute; so as to set art against art, and manœuvre against manœuvre.

In like manner the "British lion," was for a time unsuccessful against the Caffres of South Africa; but when he became accustomed to bush fighting subdued them, and they at length acknowledged his superiority.

The musk ox, or musk buffalo (*Ovibos moscatus*) has a thick hide, which is covered with shaggy hair and wool. Quiet and inoffensive, it roams to within a few degrees of the Pole in summer, while it seeks the lower latitudes as the cold cuts short its supply of food. Such is the life of some of the Indian tribes towards the far north; a harmless race, having little of the ferocity of the inhabitants of the more temperate regions of America. They are a thick-skinned people of the lymphatic temperament, difficult to rouse.

A temperate climate is necessary, to those animals of the *Bos* genus that possess great power. The northern bisons are mild creatures, compared with the southern, and the Indians of Arctic America, have little ferocity, compared with those of the far West. Great cold has thus apparently a subduing influence on the spirit of man.

In ancient times in Egypt, the rich pastures on the banks of the Nile, fed multitudes of cattle, which yielded such a valuable reward to man, that he was led to treat them as the authors of the blessings they were the means of diffusing; for they caused the land to flow with butter and milk; the produce most appreciated in primitive society. An individual of the herd possessing peculiar marks, was worshiped as the god Apis. Thus did man idolize what to his physical sight, contributed most to his benefit. The rude force with which the "ox broke the clod," to his perverted gaze, appeared mightier than the thunders of Sinai. The power of gold based on that of agriculture, was well symbolized in the golden calf. The Egyptians did not properly discriminate, between the *one* grand source of blessing and HIS instruments.

The bull is certainly entitled to important consideration, as the type of two important nations of the East and West; Ephraim (Deut. xxxiii. 17) and England. Much has been said of the mistake of valuing physical force too highly. IT IS THE PEDESTAL ON WHICH THE LOFTIEST AND SUBLIMEST EFFORTS OF REASON AND MORALS STAND. The more material carbon, and the more ethereal hydrogen, must glow together, to illuminate and warm the globe.

The sheep (*Ovis aries*) is the companion of man in the Old continent, and of his civilized brother in the New, and extends even to the islands of the wide Pacific, a faithful follower of his fortunes. Sheep are mild, docile and inoffensive, and have a tendency to congregate in flocks; a peculiarity which greatly facilitates their management, by a small exertion of force.

"The Sheep of the Flock" in a Scriptural sense, will be found in all countries, reached by "the sound of the gospel;" and it is certain that almost always where Christian missionaries have gone, sheep have gone, and shepherds with them.

Sheep are among the most dependent of domestic animals, and are completely led by their masters. This helplessness and simplicity is used in Scripture, to illustrate the dependence of man upon a higher power. Sheep run towards what they fear most, when terror overtakes them; and accept as leaders "the most timid of the flock." This is also the case amongst the typical "Sheep," who take for their guides those who "fear" the "GOOD SHEPHERD" most.

In a wild state, the rams are as numerous in the herd as the ewes, but this is not the case in the sheepfold. *Women certainly greatly predominate over men in most places of worship.*

Sheep's wool, forms the principal means of warm clothing in cold climates. This is clipped off them when alive, which is done to very few animals, as few indeed could spare so considerable a portion of their coverings. It is only those that are well clothed that can afford to clothe others.

The Semitic-European races who are typified by sheep, require the aid of some great controlling system such as Christianity, to enable them to use their high qualities for the benefit of the world. As the naked savage is indebted to the sheep for warm clothing, so is he to European nations for the Mantle of Christianity. Those who have like the semi-civilized nations of Asia, elaborate systems of their own, have the offer of a purer and holier faith. Through European commerce they can change their roughly-spun articles of home manufacture, for the beautiful and regular tissues of our looms.

The wool of the wild-sheep is not generally applicable to useful purposes. There is an impurity about the civilization of the East; but as it is *civilization* to a great extent, it is a barrier to that of a higher type. Nations who are already addicted to an elaborate toilet, do not like savages at once attire themselves in the garments of superior races.

The wild-sheep having to provide for its own wants, develops those qualities most useful to itself, but not those most valued by man; who seeks a useful servant. The juicy chops, so valued by our epicures, cannot be cut from its body, its kidneys are not well covered with tallow, and its legs are too long, to render it an easy captive, in the low pens of the civilized shepherd. Its horns are large,—a necessary defence against the wolves and beasts of prey of its native mountains. But in the plains the shepherd and his dog are the sheep's defence: there the horns are not so necessary. In many of the most highly cultivated districts, the sheep are entirely without horns.

We remarked an analogy, between the different breeds of dogs and the classes and races of men. A similar analogy exists between human races, and varieties of the sheep, which man can thus *mould*, to suit himself and the climate where he resides. The civilized is the highest type amongst men and sheep. The wild animal is not a large and profitable creature like the tame; neither does he "feed on the fat of the land;" but is turbulent and difficult to manage. The strength of the cultivated breeds of sheep resides more in the body than in the horns. But horns of suitable proportions greatly ornament the sheep.

The black sheep are usually a very inferior breed, but are preferred in some districts to the white varieties. Those with white over the greater part of the body, and black about the face and extremities, are considered particularly advantageous. They probably unite to an equal extent two temperaments; and those modified qualities which accompany them in sheep.

The goat (*Hircus ægagrus*) is stronger and more hardy than the sheep. It is more nimble, sure-footed, intelligent, courageous, and in every way better fitted to shift for itself. Its skin is tougher and makes better leather. The goat is particularly abundant in those lands bordering on the Mediterranean; such as Syria and Algeria, and the vast central country of Tartary. Goat-skin absorbs colours more regularly than that of sheep, and forms in the morocco leather, a material for which we have no efficient substitute, even with the aid of the manufacturing skill of the most eminently civilized nations.

Many breeds of goats have strong, rough hair, which in man and animals, generally indicates bodily vigour, as the fine-haired equally point to greater refinement, grace and susceptibility. The woolly hair of the Negro is not like the goat's, which resembles that of the Mongolic nations; who possess strength, coarseness, and a practical, though material turn of mind.

The camel, by far the tallest of domestic animals, is eight feet high, and possesses greater powers as a beast of burden than any other. It has great strength, endurance and docility, and thrives on the most simple and coarse food, which is sometimes also as small in quantity as it is poor in quality. Its patience under ill-usage somewhat resembles that of the ass, but its powers of resistance are infinitely greater. It is an animal that we most heartily admire. Its obedience and good temper, except at particular seasons, are worthy of the greatest panegyrics.

The Arabs have altered less than any of the great nations with whose habits we are familiar, from a period of equal antiquity. The camel also, has probably not varied so much in the qualities of its breeds, as the horse, bull or sheep. It is neither so intelligent, spirited, graceful or agile as the horse; but it is more suited for long journeys in a country abounding in deserts. It follows its master with a single-minded devotion, not to be excelled;—like the Arabs in their Monotheism.

The more intellectual nations of Europe, are less single-minded, more fit for a varied-sphere, and more capable of being altered by circumstances. They can turn their attention to a much greater variety of occupations; and although more widespread, do not maintain their position better in the home of

their race. Their breeds of domestic animals, show similar aptitudes; but they are not as long-lived as the camel.

The camel of Arabia (*Camelus arabicus*) with its one hump, is a lighter and more agile animal than that of Afghanistan (*C. bactrianus*) with its two humps, which is however larger and more powerful. In like manner the Affghans are *taller*, but less single-minded and enduring perhaps than the Arabs.

The camel owes its powers of endurance, greatly to two important anatomical peculiarities. It possesses a series of water-cells, like a honeycomb in the stomach, which filled with water previous to a journey, serve to prevent exhaustion. The animal is likewise furnished with a thick layer of fat in the region of the hump, which is absorbed on long journeys, before the other parts of the animal waste away. When in repose in a good pasture, as the vital powers are restored after an exhausting journey, the limbs and other parts of the body first recover their original bulk, and then the hump begins to swell. It is thus known by the size of the hump, whether the camel is in proper condition for a long journey.

The Arabs and Affghans, have a great many of the peculiarities, possessed by their principal beast of burden; they are equally able for the greatest physical exertion in long journeys, on a scanty supply of food. They are schooled to do without water for a long period, and are obliged to practise self-denial, to supply the lack of what God has bestowed on the brute.

The camel is a type of a faithful servant, "born in the house or bought with money" such as is sometimes found in perfection in the East. They do what they are bid, are faithful, and live on very little. Unlike many European servants they are wealth in themselves and do not tend to make their masters poor in proportion as they are numerous.

Camels kneel at their master's feet and rise at his bidding; they drink when he is done, and are willing to eat the very kernels of his dates. The resources of an Eastern prince are estimated by the number of his servants and camels, which are more generally subservient to their masters, than are the attendants and domestic animals of Europe. The Oriental servant will often contrast favourably with that of Great Britain, who is frequently sadly deficient in due respect for those in authority, and who often carries self-indulgence to an extreme point.

The lama is the connecting link between the camel and the sheep, but has not the size, docility or patience of the camel. The lama has a bad temper, being inclined to bite, and has a disgusting habit of spitting at those with whom it is offended.

Compared with the camel it is an insignificant beast of burden, but its wool is much more valuable for textile purposes than camel's hair.

The home of the lama, Chili and Peru, shows some resemblance in climate to that of the camel, Arabia and Bactriana; for these possess climates, among the driest on their respective continents. These animals were probably the original beasts of burden in their several countries. The inhabitants of Chili and Peru, show analogy with those of Arabia and Eastern Persia; but they are far inferior to them in energy, capacity and endurance. The lama and his director could never execute tasks equal to those performed by the camel and his Master. Yet the *greater* physical resources of the country of the lama, render it at present, a much more promising field of enterprise, than Arabia or Bactria.

The aborigines of Peru and other portions of South America, exhibit spiteful traits like the lama; but not the fiery energy of "the sons of the desert" of the Old World; compared with whom the South American is effeminate. Yet they bore the burdens which their masters the Spaniards and Portuguese forced on their shoulders. They made but an impotent resistance to the yoke, like the ill-tempered lama, which can only "spit at its driver."

The horse (*Equus caballus*) for his size, graceful proportions, lofty bearing and power of obeying man's commands and guidance; the high state of perfection in which he possesses the animal senses; his cleanliness and sympathy with so many of man's pursuits; is the noblest of domestic animals. He should certainly rank far above his companions of the farm; the sheep, ox or pig; who compared with him are animals of common and gross qualities.

Man the noblest of created works, requires more elaborate and careful training than those beneath him in the scale of being; and the *higher* the qualities possessed by a Man; the more does he require, and the more susceptible is he of culture.

It is said that those horses which give most trouble in breaking in, are the most powerful and spirited in the field. It is thus also with human subjects. The will being strong; the powers of opposition great; are when arrayed against you sources of annoyance; but when turned against your enemies, you have all the benefit of their force. The secret of judicious education, more consists in directing the passions and inclinations, than in subduing them. The energy of the violent and restive, as of the steady and industrious; was surely given *for*, and is capable of useful application.

The horse has followed the fortunes of enlightened nations over the world ; its native habitat being as uncertain as the seat of Antediluvian civilization. The strength of the horse varies according to breed. It appears to have been created for man's use in all countries, having a power of accommodation to circumstances, almost greater than any other animal. The original source of the domesticated horse is *unknown* ; in this it resembles the race of Man, whose tribes also are never found absolutely pure.

In the horse as in man, the greatest variety in constitution and temperament is seen. The temperaments of horses are analogous to those of men. In judging of both, the physical form should be more relied on as a diagnosis, than the colour of the hair or skin ; but still colour is significant of many qualities. We have been led to believe that colour, was formerly more largely significant of qualities in horses than it is now ; when the breeds were younger and the influences of climate and soil, had less time to accumulate. The same may be said with regard to the races of men. The terms "Black," "White" and "Red," meant more anciently than they do now ; when in the infancy of racial types the blending of stems, the grafting of branches, the conglomeration of the divers COLOURED SONS OF CLAY, WAS UNKNOWN.

Spurzheim and George Combe in analyzing the temperaments of man, selected four of the older terms used for this purpose, namely the Biliary, Sanguineous, Nervous and Lymphatic, as pointing to the predominance of the various systems of the body and as indicating them by external signs. For these, Dr. Caldwell and the American school of physiologists, have substituted the terms *Motive*, *Vital*, and *Mental*, but they have not found a better term than "*lymphatic*," which however they are disposed to ignore altogether.

In horses as in men, the temperaments are never found pure. In speaking of an animal as of a special temperament, we only indicate its predominance. The Motive temperament in horses, is indicated by great length of limb, neck and head ; coarse hair ; a want of grace in movement, but great endurance and love of muscular exertion. These horses can bear less exposure to rough weather than those of the Vital, and are perhaps less spirited ; they are often black, and when so are the best examples of this temperament. They are analogous with the men of long limbs, and heads ; coarse hair ; small waists, powerful muscles, and consequent capacity and inclination for hard work ; but these men, like the horses, without a good development of the Vital temperament are worn out early in life. The diagnosis of the Vital temperament in horses, is a thick and large

body ; wide head, perhaps a "hog-neck ;" large muscles ; powerful and rapid circulation ; long-wind, indicating large and powerful lungs ; good digestion and large appetite which is provided for by the size of their stomachs. Their disposition is less generous than those of the Nervous temperament, but more suited for long-continued exposure, and is spirited ; and if they have not so much strength in draught, live longer under a hard-life than the horse of the Motive temperament. When of the form we have described, the sorrel horse may be taken as the best type of this temperament.

The Suffolk-sorrel, an example of the Vital-motive temperament was a breed renowned for strength and endurance :—it combined large vital-organs, bones and muscles. In race-horses we see the Mental-motive or Nervous-bilious illustrated. These unite the highest nervous-sensibility and greatest muscular development, and but just sufficient vital-force, to carry them on at a rapid rate for a short distance ; neither their temperament nor mode of life, are consistent with a long career ; they are highly susceptible of accident, and very liable to take cold. Although the form of race-horses varies considerably, still they are mostly distinguished by relatively small vital organs, which if large would increase their weight, and render them too slow for the turf.

We have men among us, whose career resembles that of the race-horse ; it may be brilliant and rapid but is mostly brief.—Like meteors they blaze ! they dazzle ! and expire !

The Vital-Lymphatic temperament amongst horses when predominant, is indicated by fleshiness, softness of muscles and a liability to certain diseases : they are mostly light-coloured. The type is found amongst white horses, which are less serviceable but more mild and quiet, than the black or chestnut—usually distinguished for spirit. The analogues of these horses are a certain class of fair, puffy men ; who easily bruise ; who attain a good age ; but are lazy both in mind and body although "they make a fair show in the flesh." Such men do not often die of consumption or of broken hearts, but may have unhealthy skins.

The iron and dapple-gray horses, have temperaments analogous with the Motive-lymphatic amongst men, they have great muscular strength in "the type," which is a round full-shaped horse, high at the withers and with strong muscles connecting the legs with the body and a full-sized stomach. They are calm and steady, and do not show the convulsiveness of movement, characteristic of horses of the Mental-motive or predominating Motive temperaments ; but dapple-grey horses are occasionally seen with those qualities, which are occasioned

by the intermixture of breeds of other temperaments; they have retained a great part of the colour but have lost the proper form.

Mixed-colours in horses generally, point to a mixed temperament; black feet, mane and tail, with a chestnut body, generally indicating in the coarser formed horses, the Vital, and in the finer formed horses the Vital-Motive or Motive-nervous temperament. These horses have usually great strength and spirit, but are more impatient than the white, dapple-grey or bay horses; and have less generous dispositions; requiring considerable management, in order to prevent them from developing malicious tricks.

In the typical mouse-coloured horses, the Bilious-lymphatic temperament is well seen, indicating great muscular power, and but moderate excitability. It may seem ridiculous to some persons to talk "of a Mental temperament" in a horse, but without seeking to raise the question of the distinction of the intelligence, between man and the higher animals; still, most persons will admit, that an analogy exists between men and horses; some being as distinguished for stupidity and selfishness, as others are for intelligence and generous qualities.

Noble and generous dispositions, are more common amongst horses, having a long, high forehead, mild, intelligent eyes; a large brain-case, and a beautifully formed arched neck, fine hair and delicately formed limbs. There is immense significance of character, in the manner in which different horses carry their heads; we might write a chapter on this alone but our limits forbid it.

The Nervous or Mental temperament, can hardly be said to predominate in any animal, but man: still it is much more markedly seen in some than in others. The best temperament in men as in horses, consists of a nearly equal combination of all. We have seen several bay horses, remarkable for their beauty of form, roundness and grace, showing likewise a full development of those parts, where the leading muscles are found. These horses, having an excellent balance of physical qualities, are found very serviceable for a variety of purposes. They have the intelligence and generosity of the Nervous; the endurance and vivacity of the Vital; much of the muscular strength of the Motive with the calmness of the Lymphatic horses all in a modified degree; but still markedly seen; and when the amount of their good qualities is set down to their credit, it is found to reach a larger sum, than any other horses can show.

The analogue of this horse, is to be found in the Xanthous-haired races of Europe, the epitomized excellence of mankind

in intellectual activity, ardour in pursuit, muscular strength and vital force.

Colour is equally significant of qualities in other divisions of Organisms. Amongst plants as amongst horses, an analogy with man's temperaments is found. Red apples have mostly a sharp flavour, as have red currants, berberries and many other red fruits. Black fruits have an intensely strong flavour, as black currants, black grapes, and black elder-berries. Very light-coloured fruits, as white-heart cherries, white currants, and light-coloured plums, have a more delicate flavour than the red or black of the same family. White strawberries have much less taste than red, as have light-coloured gooseberries. Yellow fruits are commonly sweet and luscious, with less flavour than red or black; as for instance yellow gooseberries, yellow plums, and yellow apricots—for the best flavoured apricots are streaked with carmine. The sweet, rich and sustaining grain is golden, as is the basis of our nation's credit. These various colours, point to the various qualities of the fruits of the earth, they are not less significant of those of the sons of Adam. Red-haired races are fiery and impetuous, and have strongly-marked qualities, as in red-skinned peoples. The black-haired have even a greater extreme of qualities, but are less susceptible of improvement, than the yellow and lighter brown. Black-skinned races have likewise intense peculiarities, and their types are usually extremely permanent: how difficult is it for instance to eradicate the traces of Negro-blood:—one drop of ink will discolour a glass of clear water.

The Scandinavian, the most precious race on earth, has often golden hair. Sweetness and equanimity of temper is more commonly found amongst them, than in other divisions of mankind. The different combinations of colour in fruits, point not merely to a union of various qualities, but typify similar combinations in men. Thus the yellow and red apples, mangoes, tomatoes and the woody nightshade, are both sweet and sour, or have other divers qualities. Similar remarks may be made with regard to streaked gooseberries, variegated strawberries, melons, and a vast variety of other fruits, which have their prototypes amongst men with yellow hair and dark skins, black hair and fair skins, or dark hair with bright complexions. Fruits which longest retain their good qualities, are seldom black or red; and dark and red-haired races have generally less evenly balanced frames, and consequently do not live so long as those of more mixed colours.

Lastly those fruits which show great paleness of colour and a want of flavour, have analogy with albinos, or those who from extreme fairness have a bleached appearance. Such are gene-

rally characterized by a want of vigour. Those eggs of the common hen, which are distinguished by a rich flavour, have usually a tinge of yellow on the shell, and yolks of a strong yellow, have much more taste than the pale-coloured. The eggs of wild birds which have most flavour, are strongly coloured, such as plovers', bustards', whimbrels', blackbirds' and many gulls'. The dark eggs of the black-headed gull, have much more taste than the light and spotless ones. White or pale eggs have much less taste as those of the owl, starling, linnet, greenfinch and wryneck. The eggs of the petrel, though white are distinguished by a strong musky flavour; this however appears to proceed from the green oil which comes from the body of the parent bird, and does not properly belong to the egg itself. Honey has also generally a stronger flavour, when of a yellow than of a very pale colour. Yellow sugar has more taste than white; and the dark sugar of Cuba, of an earthy brown colour, has the strongest flavour of all. Milk when of a cream colour is much richer in taste than when blue, and butter when of a deep straw colour, has much more flavour, than when pale in colour. Red wines abound more in bouquet than white (pale pink or yellow): they have more pungency, but in general less sweetness.

In considering the scent of flowers with reference to colour, we find that those of the *same class*, of yellow or red tints are strongly scented. Thus the white clover (*Trifolium repens*) has less odour than the purple (*T. purpurea*), or the yellow hop trefoil (*T. procumbens*); the white rose than the red; the white than the yellow tulip. The white hyacinth (*H. orientalis*) has a more delicate smell than the deep-coloured. The white lilac has much less scent than the purple. The red clove-carnation has a much stronger smell than the white. The *colour* in all these plants is not the *cause*, although the accompaniment of this odour: it merely indicates in them as in other divisions of organisms the degree of strength or balance of qualities.

The colour brown in insects, the higher animals and man, is the accompaniment of great vigour and endurance; as in bees, ants, dark chestnut horses and human Arab races. Red represents the fiery and hot-tempered in insects, horses and red-haired people. Black represents sharpness, with a great deal that is restive and a considerable impatience of control, with as great activity but with less vital force than red. This is especially true of black insects, fowls, horses, and human races.

In the different breeds of horses in various countries, we see analogy with the races of men.

The choice breeds of Arabia, were long considered the finest

horses ; and possess courage, generosity and endurance not to be excelled even in England, where "horse-flesh" has attained its highest state of perfection. Unlike most English high-bred horses, they are easily fed, and their stable,—when they have one at all, is of the simplest kind.

It is clear that the British, have now surpassed the standard reached by the ancient Semitic nations ; and are infinitely before their modern representatives in the East ; who like the Arab horses still show much endurance, notwithstanding their relatively scanty numbers.

The Tarpan horses of Tartary, which roam round the sea of Aral, are almost as vicious and difficult to reduce to obedience, as are the lawless, thieving inhabitants of Khiva.

Are writers correct who place the seat of primeval civilization in Tartary, and adduce as an argument, the probable fact of the bulk of domestic animals, being indigenous to that country ? If Tartary be not the home of the horse, where can its native place be ? Can it be Arabia, one of the seats of early civilization ?

The Muzin or feral horses, have larger heads and shorter necks than the Tarpan. These show a resemblance to the big-headed nations who tame them ; who have better qualities than the Khivites.

The Tarpan have a violent antipathy to tame horses, which they attack furiously ; and in general will not breed with them. The Khivites isolate themselves in a similar manner, and show equal antagonism to other divisions of the human race.

The feral horses and their human types, intermix with their neighbours ; and are more capable of culture than the Tarpan and the Kivites.

The horses of Egypt, so early famous, were strong bulky creatures, but rather slow in motion ; which latter peculiarity their masters displayed. The civilization and horses of Egypt, took a prominent part in "the world's stage," at a period prior to the rise of the Four Great Monarchies. Indeed some think that the Egyptians, were the nation who first reduced the horse to subjection ; and there is no doubt that they were among the earliest, to learn horsemanship.

The Chaldean horses next became celebrated, as civilization culminated in that mighty empire.

The horses of Xerxes are much spoken of by Herodotus and other writers. They shared the vicissitudes of conquerors ; many perished with the army of the Persian King, and many, when the invasion of Greece was returned on Asia, took their part in the toil and triumph. The Persian horses were the most celebrated of those of ancient countries, for every grace,

spirit and vigour which we are accustomed to admire in this animal ; and received in the ancient language of the country, a name signifying "*wind-foot*."

The Armenian and Median horses, which in early days attained a large size, were used by the Persians as baggage animals, and for their war-chariots.

The Gothic or Scythian nations, carried into Europe excellent horses, which possessed like themselves a high degree of hardness and endurance.

The Roman horses like the citizens of Rome, came from an immense variety of localities.

The Barbary horses were early brought from that country into Spain ; and perhaps contributed eventually, to the formation of the jennets ; a high-spirited and noble breed. They showed an extraordinary amount of freedom of movement, and were of the same stock probably as the Lusitanian or Portuguese horses ; which according to Justin, were "born of the winds." These were the types of the Moors ;—emigrants from Africa, who so greatly contributed to the advance of civilization in the Peninsula. These were suitable ancestors of the cavalry of Cortes and Pizarro, whose passages over the field of glory and of fame, have shone like sheet lightning, from East to West ;—to be replaced by grey gloom.

But the horse that can perform the hardest work for the longest period, is to be found in more northern regions which also possess breeds, having the greatest swiftness of paces. The British horses were famous when Julius Cæsar invaded the country, and some of them were carried by him as trophies to Rome ; but they were afterwards modified by intermixture, with the animals of Italy, Gaul and other countries.

The Britons were a fine race of people at the time of the arrival of the Romans, and had made considerable progress in civilization. The system in existence in the British isles was shattered in contact with that of Rome, which took the place of the falling edifice ; but the Roman power at last fell to pieces by its own weight. For some time after the period of its decline in Britain, the breeding of horses was much neglected, but when the Saxons began to exercise an influence in this island, attention was given to the improvement of the stock of this valuable animal.

In the reign of King Athelstan, the English nation began to grow in importance, and the breeds of horses also rose into celebrity. The infusion of Norman blood, greatly invigorated the human population of these islands ; and the introduction of Norman horses, had an equally beneficial effect in raising the standard of the equine race.

During "the wars of the Roses," horses were much neglected and consequently greatly degenerated. At the period of the *Renaissance*, their breeding received more attention than it had attracted for many years ; for most departments of knowledge and industry, received a great impulse. The wise Henry VII. of England, did his best to improve "horse-flesh," and among the good deeds of his successor, may be mentioned the laws passed by him, for the regulation of the breed of horses. He was enthusiastic on the subject ;—appeared to have a real affection for the horse ;—and was a skilful rider. Henry VIII. resembled a Tartar prince in some peculiarities. He liked a variety of wives ;—had an irascible temper ;—was extremely impatient of control ;—had little regard for human life ; and gave a large share of attention to the breeding of the horse.

The English breed of horses, improved much during Elizabeth's reign, but they gained perhaps more in strength than in speed : emblematic of the state of manners, in which strength and power, exercised more influence than refinement and delicacy.

James the FIRST introduced from Scotland a love of horse-racing ; and was the first of a line of kings, who did much for the turf.

Charles the SECOND was one of the best horsemen of his time ; and firmly established a taste for racing, by giving silver cups and bowls to be run for. This was coincident with growing civilization.

James the SECOND was not less addicted to sports ; but his successor William the THIRD, was more inclined to encourage useful horses for riding purposes, than racers. He introduced much foreign blood into "horse-flesh," as might have been expected from one, who was not only a foreigner, but who greatly encouraged the foreign element in this country.

Queen Anne and her consort Prince George of Denmark, did much for horse-racing ; but the sport had now become thoroughly naturalized in England. To this reign is traced the origin of some of the best races now extant, which sprang from the celebrated "Darley-Arabian," the progenitor of so many splendid animals of our own day.

Cart-horses are more useful than racers and light riding horses. There is something very "Gothic" in the gigantic cart and dray horses. Grand in movement, noble and independent in bearing, yet willing to the utmost, to act the part of servants ; they may typify our hard-working population, alive to the dignity of labour and of the moral importance of being good servants to the state.

Cart-horses are slow in movement, but by far the most

powerful of all breeds; they have often noble, generous qualities. They are of the Sanguine-lymphatic, and Sanguine-bilious temperaments; which must be united with highly Nervous blood from another parent, if we would rear a race of useful half-blood horses; fit for the greatest variety of purposes. These "cob"-horses which unite the qualities of two classes of animals, may typify "Middle Classes" in English society, who can adapt themselves to a greater variety of occupations, than those above or below them; having great physical strength, as well as great mental activity.

Some Irish horses have been good racers, but they are said to be more angular in form, and hotter in temper than most English breeds;—thus truly Hibernian in their proclivities. Gothic horses, show an inclination to stoutness and weight of body, which those bred in the deserts do not display.

The Arabian horses are more lightly made, and more sensitive in their nerves than the Gothic; and are more quick and acute in their senses. Similar remarks apply to the races of men inhabiting those countries. As the most remarkable nations, have sprung from the combination of tribes possessing divers, but harmonious qualities; so the most generally useful and valuable horses, are the product of the union of greatly differing breeds. The Man not for one age; not for one country or one purpose; but for all time, can alone originate thus;—and the Horse *par excellence*.

Man can breed horses and other animals, suited to his purpose, and produce modifications in them in accordance with his will. He can perpetuate and increase peculiar qualities, and subdue others, until they gradually approach his ideal. The same laws which regulate the breeding of animals, influence the offspring of Man. Judicious "selection," which should be no means "Natural," should bear on this important matter. The lessons taught by history, physiology and mental philosophy, render clear to us how *transmutable* Man's qualities are, and how he has himself in his own hands. Surely Man should not regard himself *less* than the brute! If he can improve the race of his domestic animals; if he can increase their good qualities and remove their defects; if he can increase their defects and lessen their good qualities; surely he is bound to apply the same principles with *discrimination*, for the benefit of his own Race.

"Physician heal thyself," was an old proverb in the days of our Lord, and we in this enlightened age; the heirs of the science of all time, are doubly bound to attend to the physical and moral improvement of our species. For all History informs us, how vices, diseases and short lives are *hereditary*;

and how long life ; morality and intelligence, are alike TRANSMITTED FROM PARENTS.

The wild ass (*Asinus onager*), the most savage of its genus, inhabits the deserts of Arabia and Persia. It is proverbially fleet in movement, and almost defies the pursuit of the swiftest horseman. Like the Tarpan wild race of horses, it furiously attacks with teeth and hoofs, its allies in a domestic state.

Asses are content with, if they do not prefer a coarse diet. The harshest, most bitter and unpalatable herbs, rejected by the ox and horse, whose mouths they would injure, are eaten eagerly by the ass, to whom as being succulent food they are especially refreshing ; and in the desert partly supply the deficiency of water. Although the ass is so wild, fierce and spirited in its natural state, yet when caught, after a while it sinks down into a calm and patient drudge.

There is considerable difference of opinion amongst naturalists, as to the wild species from which the domestic ass is derived ; but its origin is very commonly attributed to the "Onager."

The ass, although the emblem of folly in man from the most ancient times, by no means excites our laughter, unless when its voice "is heard on high." The greatest fools are not those who have the least capacity ; but those who attempt what is beyond their powers ; and speak when they had better be silent. Were they content to act an humble part, they might even like the patient ass be esteemed.

The muscular system of the ass is so large and powerful, that we are not surprised that it should be able to carry immense burdens, in proportion to its size and weight. It is of the Bilious or Motive temperament, or that in which the fibres of the body are especially strong, for in their firmness its muscles resemble metallic wires covered with leather. Its skin is exceedingly tough, and forms a useful leather much used in the East.

The ass it must be confessed, is worthy of more consideration than it generally receives in England. It can never rise to the nobility of the horse of high blood ; but still the asses of Spain, Persia and Egypt, are far more admirable than many "hacks." In like manner, we see a great superiority in the more respectable and better specimens, of the natives of these above-mentioned countries, to "the scum" of our population. A fine Oriental character is much to be admired ; a courtesy and reverend deportment pervade it. Such an one is spirited, poetical and loves freedom, and will not be guilty of those acts of impurity and grossness common to our recreant classes, who are not influenced by the restraints, which govern the better specimens of the Arab or Jewish nations.

The ass shows much cunning, excessive obstinacy and love of contradicting ; often perhaps the result of capricious and violent treatment in youth ; which have similar effects when applied to man. The patience of the ass is often the result of insensibility, for its temperament is often bilious-lymphatic which in beasts as in man, is accompanied by an insensitive Nervous system.

It has been said that the wild Arabs of the interior of Arabia, are far superior to those in the neighbourhood of Egypt ; and we suppose that even the celebrated Egyptian asses, do not approach the original wild stock, either in symmetry or bodily vigour.

The mule between the mare and the ass, is that with which we are most familiar, it possesses some of the peculiar properties of both parents. It is exceedingly tough in muscle, and acute in observation ; which is united with extraordinary obstinacy. The mule being less influenced by sexual feelings, is harder, less gentle or tender in its nature, and more selfish than the ass ; but its other instincts appear more acutely developed.

Some persons resemble the mule in disposition. They have commonly little sympathy with the opposite sex, and are generally cold and unsympathizing ; but are quick and shrewd in the ways of the world.

Mulattoes in Great Britain are born mostly of Negroes and White-women ; typified by the offspring of the ass and the mare ; while those born in other lands, are mostly from White-fathers and black-mothers ; which illustrate the Hinneys. The former are said to be superior intellectually ; while the latter have better physical constitutions. Mules born in this country, contrast in the same manner with those of other lands, and present similar analogies with Man. These Mulattoes are good servants ; in fact they are rather better than pure Blacks, although inferior as Moral characters, and usually very obstinate.

The tapirs approach the extinct *Paleotherium* of the Paris basin, and are thus connecting links, between recent and fossil Mammalia. Two species have been noticed, each peculiar to an opposite division of the globe.

The *Tapir americanus*, is the gentlest of its tribe, for it does not attack any animal unless driven to desperation. It is the largest mammal that inhabits the dry land of South America, and in appearance, resembles the elephant as well as the pig. Its strength is enormous, and its skin is too thick to be easily pierced. Its food is similar to that of the elephant ; but it also swallows a miscellaneous quantity of rubbish. It has great power of adapting itself to circumstances, for it is found in most parts of the continent of South America independent of latitude ; which is certainly an extraordinary geographical

range for a herbivorous animal. Although usually inoffensive, yet it sometimes bites furiously, dogs, or other animals venturing to attack it.

The Pachyderms like other divisions of the fauna of the Old World, are much more vigorous than those of the New. The tapir of America, is insignificant compared with the elephant and rhinoceros, and may represent Nations which are relatively weaker and more effete than those of the Old continent; as do also the feeble animals of other classes. The puma of South America, we formerly compared with the Republics of that country, which prey upon the aboriginal populations, as that feline beast does upon the tapir.

The Malayan tapir (*T. indicus*) is the representative of the elephant in the great isles of Sunda, and a type of their less civilized Human population, as contrasted with that of Asia and Ceylon, the home of the colossus of the forest.

The Buddhist nations of Ava, Birmah and Ceylon, are a civilized People compared with the Malays; but with all their intelligence they are gross in their manners. They may be typified by the elephant; who with his many interesting traits of character is still a most uncouth animal.

The coney or *oueber* (*Hirax syriacus*), is an animal frequently mentioned in Scripture. It is said to be feeble and to seek its refuge in the rock; a habit of this animal in the present day. It does not burrow in the earth like a rabbit, but takes up its dwelling in the crevices of the rocks. This feeble animal in these situations, is thus secure from the attacks of enemies that it could not otherwise resist.

The coney taking refuge in the rock, as a scriptural illustration, is intended to convey a lesson to the weak, to take refuge with the strong. The rock being hard and enduring can never be moved; whereas the burrows made by rabbits and other animals, are liable to be crushed by the foot of the great beasts of the earth. The habitations raised by Man, for his protection, may in a similar manner be destroyed by his foes.

CHAPTER XII.

THE RESEMBLANCE BETWEEN MAN AND ANIMALS.—*Continued.*

ELEPHANT—RHINOCEROS—HIPPOPOTAMUS—PIGS—HOG-DEER—PECCARY—
 ANTELOPES—CHAMOIS—GNU—ELAND—NYLGAI—ELK—REINDEER—
 RED-DEER—GIRAFFE—MUSK-DEER—SLOTH—ARMADILLO—ANT-EATER—
 MANIS—ZEBRA—WOLF—KANGAROO—RAT—WOMBAT—DUCK-BILL—WHALES—
 DOLPHIN—PORPOISE—GRAMPUS—NARWHAL—SPERM-WHALE—GREEN-
 LAND-WHALE—RORQUAL.

THE elephant (*Elephas indicus*) is the most gigantic of recent terrestrial quadrupeds. Its unwieldy extremities which are of little use for prehensile purposes, are compensated for by its trunk, one of the most wonderful organs in the animal kingdom, which is a bundle of 40,000 muscles!—whose touch is at once delicate and powerful according to the will of the animal; capable of picking up a hair or of lifting half a ton! This creature with a most gross exterior, unites an intelligence equal to that of any other brute; and when in a captive state shows so many excellent qualities, that we greatly admire its character.

The external appearance of the elephant, illustrates its characteristic qualities; its trunk represents its intelligence, and its feet its grossness. The anecdotes related of its instincts are marvellous,—how it appears to reward favours, and revenge injuries, even when a long period has passed. Like most noble creatures, it must be treated with justice and moderation, or it cannot be made a useful servant. These animals are captured in a curious manner, with the aid of trained female elephants, which seduce them into the toils of the hunters. The males being much occupied with them, forget their ordinary instincts of prudence. Elephants in general are soon reconciled to their captive condition, and with judicious treatment become faithful domestic animals.

Those who are most elephantine in size and strength amongst men; great fleshy cumbersome creatures, with coarse, broad hands and feet, and who tower over their contemporaries in height, are not unfrequently, like Hercules and Samson, easily

led captives by designing members of the softer sex. They not only yield themselves to these, but become the prey of sharpers, thieves and jewellers of their own sex.

Elephants are frequently caught in pitfalls, which are deep holes dug in the soil and covered with branches of trees, over which the gigantic brute steps, when they yield to his weight and he falls into the pit below; perhaps maimed, or at least kept a prisoner till despatched by his enemies.

Such is the fate of some men who are *great* in nothing else but size, and whose figure reminds us of the physical part of the elephant's nature. His more intellectual character, as well as a certain resemblance to his *physique*, is shared by a few men whom one stares at, and who are interesting, but surely not beautiful. They have tenacious memories, are strict in fulfilling and performing engagements, and learn a great deal from personal observation. They are inferior to the elephant in modesty. Here is a portrait of a gentleman, sketched by one who sat opposite to him at a dinner table.

Like the elephants of Germanicus he could behave decently at dinner, and like these animals he had a very long snout, which we suppose must be called a hooked nose. He had lost his teeth, and his nose hung down over his mouth. His under-jaw was prominent, and his thick under-lip came up to meet the long nose, and nearly attained that object. He was obliged to push this flexible organ on one side when he took wine with a lady. He had broad flat ears, which might poetically be compared with fig-leaves. "A constitutional asthma" was his excuse for a decided habit of grunting, when he agreed with the speaker. In his last moments he became still more like an elephant, his feet swelling to enormous dimensions.

This man was a worthy wine merchant of Bordeaux, who was anxious to have a third wife. He named the subject to his customers and wine-growers, and was shown a lady only fifty years younger than himself. Through "the arts" of the young lady herself, this "Old Elephant" was induced to take her without a portion, and under the influence of his best wine, to sign a most advantageous settlement. The young lady who possessed great beauty, was united to this interesting elderly gentleman. The happy couple were taken in the same photographic group, "January and May" over again;—loosely-hanging skin and treble chin, contrasting with a fair round face and bright complexion;—a second edition of "Beauty and the Beast."

Anxious to know the qualities of an individual of such a peculiar aspect, we made enquiries of his intimate friend. He was described "as a person of great observation, and with

much intelligence of a certain kind, but with little refinement." He was faithful to his friends, but inclined to be revenged on his enemies. His habits were sensual, and he remembered most things in connexion with a good dinner, or a bottle of good wine; wanting which his temper was of the most irascible kind.

The Rhinoceros's skin, is of immense strength, thickness and toughness, difficult to pierce, and hangs like leather about the animal. The rhinoceros possesses but a low degree of nervous sensibility, and as might be expected its sense of feeling is not at all acute; so that a tremendous whipping is necessary to rouse it. Its eyes from their high position on the top of the head, are not adapted for discursive observation, but the defective senses are greatly compensated for by a wonderfully acute sense of smell, of which the enormous development of the region of the nose is an indication. Considering its great powers it shows little courage, but at certain seasons, will encounter any animal that comes within its reach, "running" a sort of "muck" at every one; in which it shows a resemblance to the otherwise non-sensitive Malay-race, who appear often so indifferent to physical suffering.

The rhinoceros is indolent compared with the elephant, and loves to roll in marshy, swampy land, and to lie all day with little motion. It is moderate in its appetite considering its bulk, and is not omnivorous like the pig. Its small unpleasant eye, indicates apathy, indolence, and a want of docility.

The rhinoceros family, represent savage, barbaric power amongst Empires and Nations. In India the Empire of the Great Mogul, was typified by the one-horned rhinoceros (*Rhinoceros unicornis*) of that country. Like that animal it was mighty but lethargic; unintelligent and cumbersome; but could not be easily crushed by force. The *Rhinoceros tichorinus* which once roamed over Europe, may represent the Roman power. The rhinoceros of Abyssinia, may illustrate the fierce Gallas Princes; and those species peculiar to the great Isles of Sunda, may also typify the Sultans of the country.

In the Middle Ages it was supposed that cups made of rhinoceros horn, possessed the power of discovering poison in wine;—a curious delusion, which could only have arisen, from the fact of the horn effervescing with strong and poisonous acids.

If we examine the structure of the hippopotamus, we see how beautifully it is adapted to its habits, as most other animals are found to be when closely scrutinized. It is not carnivorous, but subsists on herbage, green crops, or the roots of aquatic plants. Its disposition is most savage towards man

and beast, whom it does not hesitate to attack on land or in water. It often upsets the canoes of the Negro traders, and can easily crush their frail sides with its teeth, or with less effort mangle the head of the wrecked voyager. It may however sometimes, as it rises from the bottom, upset a canoe without a malicious intent. Just as a spear thrown at random by some ferocious Negro, may cut short the career of an enterprising traveller.

The hippopotamus being amongst the most savage of animals, properly typifies the lighter-coloured Negroes and Bosjesmen of Africa, who resemble it in some points of character. This animal is without a horn, and the Bosjesmen are without Great Chiefs.

We once met with an individual whose deformed countenance, had a slight likeness to the hippopotamus ; his head was flat, his forehead low and nose short. His whole muzzle was excessively broad and the nostrils very open. He was brutal, savage and coarse to most persons he encountered, but had a fondness for his children, similar to that which animals have for their young, but none of that high-toned feeling which leads parents to educate their offspring well ; so he brought them up in the same swinish way in which he lived. Conscious of his great strength, he treated those with whom he came in contact, either with surly contempt or rude ferocity. He accomplished nothing by conciliation, but much by the crushing weight of his own unwieldy body ; his physical power and bulk being immense.

The pig (*Sus scrofa*) is an animal most differently regarded by nations, and is in itself a very variable creature according to breed ; which does not however, so much differ with the climate as that of most animals. The manner in which this animal is treated by different nations, is in harmony in most instances with national origin and filiations. Those nations now regarded as Semitic, abhor this creature ; while the Japhetic and those nations who have been lost amongst them, set a great value on the porcine race.

Persons of a low caste, evidently allied to the Melanic children of Ham, are in India and some other countries, the breeders and keepers of swine. The pig is more nearly typical of the true Negro than of any other nationality, if we except the pork-eating populations of China, Tartary, the Indian Archipelago and Polynesia ; where pig-life and pig-manners, attain their greatest development. But the British can breed pigs which equal in coarseness those of any country. A debased Briton is one of the most awkward and sensual of men, equaling in these respects the untutored Savage.

The pig's prolificacy, surpasses that of all other animals of nearly equal size. Its coarseness and savageness of manners, its undue amativeness, which it is always ready to gratify, is shared by the less chaste and more corrupted nations, who are worse than the British in general; but whom the British occasionally exceed in debasement.

The Chinese pigs are much more concave at the root of the nose, than our hogs. The same observation may be made with regard to the noses of the nations. Yet our lowest classes, whom we think frequently show evidence of Mongolic affinities, have sometimes this concavity at the root of the nose. Those persons who possess superior mental qualities, have seldom very low noses; and those pigs whose instincts are the most acute, such as those of the wild boar, have—for pigs—High noses.

We shall now consider individuals of the human species, who resemble the genus *Sus*. They are mostly "scrofulous," which is but a synonym for *pig-like*. An eminently scrofulous constitution, is consistent in man with great amiability of disposition; but the resemblance to the pig is not carried to a great length, in these cases being only "skin deep:" they both are subject to similar complaints. The true porcine-men, are very narrow and selfish in their sympathies, and care only for their own advantage and that of their offspring. They are acute in their instincts, and have an accurate knowledge of the value of common things, beyond which they do not care to go; for all their attention is generally given to their own concerns. Like pigs they snore and snort much in their sleep, of which they take a great deal. They awaken slowly, and are apt to be at once seized with a ravenous desire for food, over which inclination they have little control.

It is certainly the case, that in man the habits of life influence the style of countenance. And what is more, an assimilation is constantly going on, between classes of men and the animals they most associate with. Racial proclivity assists this assimilation in some cases; for the Mongolic and Finnic races, show a much greater resemblance to pigs, than do Caucasian nations. The individual we are about to describe, might have been,—as some of the lowest of the inhabitants of these islands are believed to be,—of remote Finnic extraction.

Pigge Wiggins, called after his uncle Pigge the grocer, excited much ridicule amongst his schoolfellows on account of his name, which was however highly appropriate to one, whose appearance and habits so much reminded the most casual observer of the hog. He had a peculiarly sonorous way of eating, for which he was generally disposed, and as might have been expected his waist eventually became his thickest part. His eyes were very

small, but prominent, and without much manly expression. His nose was long, broad and hollow; it was decidedly turned up, and described a segment of a circle, from the tip to the eyebrow.

He had much intelligence, but was never known to perform a truly generous act, or appreciate the pure, lofty and elevated. His father bound him apprentice to a cattle dealer, and he at last rose to be an extensive pig-merchant, and thinking himself of mighty dignity, insisted upon being called "Squire Wiggins." Those who live much on pork and gross food, and are low in habits of living for many generations, may become brutalized and degraded to the level of "Pigge Wiggins."

The Wiggins family for four or five generations,—which is as far as we can trace,—had been farmers of most grovelling habits, but wealthy for their station. Persons like "Pigge Wiggins," although gluttonous for food, yet do not care to see others well fed at their expense; being grasping, they stuff themselves, but no one else. Such men seldom come within "the gripe of the law," although they practise adulteration, and the sale of diseased meat, when it can be done with impunity. As they are not fond of hard-work, they mostly avoid mechanical trades, and choose easy or profitable businesses, like those of publicans or small brewers.

White pigs are more sickly than mottled or black pigs, being of a less mixed temperament. Extremely light-haired "porcine-men," according to our observation are fattest; but the dark-haired are the best, being the strongest and the least repulsive.

The hog-deer (*Babirusa alfurus*), is a ferocious creature, and at certain periods attacks almost all it meets. It goes about in herds, feeding chiefly on rice and maize. It is more elegant in form, and graceful in outline, than any of the pig family. In which it resembles its compatriots the Malay natives of the Moluccas and Sunda Isles; with whom it would be well to contrast the purer Melanic races, and the domestic swine they keep. The Malays, like the hog-deer, are fearfully excitable, restless, independent and not to be trifled with; but when enraged must be killed outright as an example to others; as also must be done with these hogs, when they too "run a muck."

The hog-deer takes to the water with ease, swimming across straits and narrow arms of the sea without much difficulty. They are more excitable than other hogs; and as a usual accompaniment of a high amount of sensibility, they are more refined in appearance.

The white-lipped peccary (*Dicoteles albirostris*) represents the wild boar in South America. It is gregarious, and when

in great numbers does not hesitate to attack men or horses, surrounding them and ripping them up. But singly or in small numbers, they are commonly shy, like such wild tribes as the Tupi, who skulk into the recesses of the forest at the approach of the European traveller; but attack him with fury when they greatly outnumber him.

The collared-peccary (*D. tajassu*) from its solitary habits is a comparatively harmless species, and it is also milder in its expression and disposition, than its white-lipped congener. Yet it can defend itself with great valour, when hard pressed by the hungry hunters;—as the Aturian Indians did, when on the point of being eaten up by the cannibal Caraihs.*

The antelopes are divisible into three classes; the Cervine, the Bovine and the Equine. As a type of the first class, we take the aerial gazelle (*Antelope arabica*) which is graceful, beautiful in markings, and has large, bright and melting eyes; to which those of oriental females are often compared. With all its beauty the gazelle has little intelligence, although its playfulness and grace, render it attractive to the eye.

Lovely but uneducated Eastern women, have these ensnaring qualities, which enchain, but do not elevate any but the lower orders of mind. Such have many animal graces; but little of that companionable intelligence, which ought alone to retain the affection of the civilized Man. And it is well for him that such is the case, and that he is not long under the influence of the uncultivated.

The chamois (*Rupicapra tragus*) allied to the goats, is one of the most nimble of Ruminants; and its fleetness is as extraordinary as its agility. It has a considerable amount of intelligence, which enables it to adapt means to ends, and which combined with its watchfulness, renders it exceedingly difficult to approach, in the mountainous districts it inhabits. Its love of freedom is so strong, that captivity does not agree well with it. It may be pursued and killed, but it cannot be domesticated; and to hunt it in its native haunts, is one of the most perilous of occupations, not to be followed except at risk of human life.

We see in the chamois, an analogy to the Natives of the Alps and Pyrenees, who are at home in their mountains, and difficult to approach in a hostile manner. They may be subdued and caught by those desperately resolved on the undertaking; but we question whether the success is worth the cost. It would be but a barren triumph, producing little profit.

The white-tailed gnu (*Catoblepas gnu*) that traverses in great herds the interior of South Africa, is one of the most curious

* Humboldt's Views of Nature. Bohn's edition, p. 172.

of quadrupeds ; linking the three important families of Deer, Horse and Buffalo. The general effect of their colour on the eye is that of a deep umber, not quite black ; which is scarcely distinguishable when they are running at great speed. Their tails and manes are greyish. They are compactly-formed, well-proportioned, and possess great strength and agility. It is often difficult to approach them even on a swift-horse. They can make a formidable defence against beasts of prey, have been known to attack man, and to trample on and gore him to death ; for the large herds in which they congregate, would be formidable to an armed regiment. Their eyes are very fierce, their noses broad, and their whole aspect when excited, inspires terror.

We see in these antelopes, a resemblance to the Zoolus and Caffres ; the probable result of an union of the three branches of the "Human Family." They are fierce, and crush any that fall into their power. "They can make good use of their legs" in running from an enemy, although their ferocious aspect is quite capable of terrifying him ; their eyes rolling like those of the gnu and showing the whites only. Caffres are not quite black, but much darker than Bosjesmen, and some parts of their bodies are of a lighter colour ; yet the head is covered with very black hair. In order to conquer them, stratagem must be used. They can be domesticated as well as the gnus. Dr. Colenso relates a memorable anecdote of a tamed Zoolu.

The eland (*Oreas canna*) a type of the bovine antelopes, is a gentle, graceful creature, and showing great capacity for being tamed, may be useful to the farmer, unlike most of the animals of South Africa. It varies a good deal in size and colour. We see in them points of contact, between the antelope and the ox. They may be compared with the Bechuana tribes, whose mildness give hope, of their being useful auxiliaries to the civilized settler.

The nylgai (*Portax picta*), a fine species, is a native of Affghanistan and the north of India. They vary from greyish-black to yellow-bay. They are powerful animals, only second in this respect to the moose among the stags. They can be domesticated and trained for harness, but are sometimes violent and ill-tempered in their captive state. We see in them analogy to the tribes of Northern India, who variously dark and fair, can be useful when bent to the yoke. But their fidelity and steady conduct, cannot always be depended on ; and if not treated in a most judicious manner may become exasperated against their rulers, and do their best to injure them.

The moose or elk (*Alces malchis*) is an enormous creature, and far exceeds any of its tribe in bulk. It roamed,—or a species

nearly allied to it—through many countries ; but it is now extinct in most of them. It is not suited for civilized life, or for thickly-peopled districts ; but it can be tamed, and may be used for purposes of draught. Its movements are clumsy, yet it is capable of maintaining its speed, longer than almost any other quadruped except the reindeer. It is simple in its habits and solitary in its life.

We consider the moose a type of those fabulous “giants,” who in early ages were said to roam over northern countries, but who have now disappeared, and only their skeletons remain ; the legacy of time,—food for Anthropologists to Eat.* Scandinavia, Poland and Borean-America, are yet in a more primitive state, and can therefore endure the presence of the elk, which however will disappear as civilization advances.

The reindeer (*Cervus tarandus*) is likewise an inhabitant of Arctic-Europe and America. In Lapland it takes the place of the horse, cow and sheep ; for it is excellent as a beast of draught, and as a milker, and its skin yields a most effectual protecting wrapper against intense cold. It is remarkable for its swiftness, and power of long endurance, in which it probably equals the camel and surpasses the horse. It resembles these animals, in being the most useful friend and servant to man in its native country. Although beneath *them* in intelligence and strength, yet it is as suited to its Arctic habitat, as they are to their homes.

The reindeer is not adapted for a temperate climate, as has been fully proved ; several careful but unsuccessful attempts having been made to introduce it into Great Britain. In like manner the Laps and Esquimaux are unsuited to our climate, not retaining their health or living long here. Both apparently require a protracted and rigorous winter, to burn up the excess of carbon in their bodies, which would otherwise accumulate and disturb circulation. Those who visit these northern countries, find both the reindeer and their masters,—particularly the Laps,—indispensable.

The red deer (*Cervus elephas*) is the favourite, and the noblest animal of chase, in this and other countries of Europe. It is however timid, except when excited by sexual instinct, when it rushes furiously at every animal it encounters. Its timidity and comparative harmlessness, have rendered laws necessary for its protection in those populous countries, where it is highly valued as an object of chase. It much enlivens our mountain forests, giving in many instances, the spirit of life to a grand, but cold,

* Reference is here made to the large bones of men occasionally found in different localities, which are variously supposed to belong to “Giant races,” “Pre-Adamite men,” “Sons of Anak,” or “the Reindeer Period.”



THE CHASE OF THE GAZELLE.

grey, and dull landscape. With all its timidity this splendid creature carries its head in a lofty manner, but its watchfulness renders it difficult to approach, unless by the most careful precautions.

We think these deer typical of an aristocratic class, who do not—as usual unite noble actions to noble birth, but have a handsome exterior with much physical power. The stags have great facility in pushing with their horns, and their principal energy is seen when they are in love. A class of tall and handsome individuals exist, who are of little profit to society; but who are capable of occasionally rendering themselves very disagreeable to others by their pushing manner, which is most seen on the occasion of an amour. The noses of the persons to whom we refer are long, and their extremities are delicately formed; peculiarities which they possess in common with the stag.

These men like the stags, will become scarcer as the century advances, in accordance with the operation “of the law” by which those members less useful to the well-being of the community, are expelled or reduced to a minimum.

The deer is smaller and less noble than the stag, but is nevertheless a graceful animal. The stag inhabits the Highlands, the deer the Lowlands. The former may represent the silly gentleman of the North, and the fallow deer the elegant but effete noblemen of the South of Europe, for whose possessions the advocates of democracy thirst; as the hounds do for the blood of the stag and deer.

The giraffe (*Camelopardalis giraffa*) so curiously spotted, is the tallest of quadrupeds, and is quite unique amongst living animals in form and habits. It resembles the deer tribe in some few points of character, and like them is not ferocious except at the season of love. Owing to the position of the eye, the giraffe can see almost as well behind as before: hence its quickness of sight, and as it is timid, readily betakes itself to flight, and is extremely difficult to pursue with success. Its horns are covered with skin, but nevertheless they can be used by it as powerful weapons of defence: the males especially, often indent each other's skulls with them.

We see a slight resemblance between this creature and the tall Nubian-Arab, who belongs to a mixed race, and unites two sets of qualities, as does the camelopard. The Nubian-Arabs are crafty, and more easily take alarm than tribes of pure Arab descent, but are usually less quarrelsome. When they do fight, they frequently use their head and feet like these animals:

We feel regret when a Nation, or curious genus of quadrupeds is ill-treated or destroyed; and we almost fear that both the

nationality above mentioned, and the giraffes, have suffered in consequence of civilized man.

The musk-deer (*Moschus moschiferus*) is the animal that yields the musk of commerce, which in its pure state is so much admired by Oriental nations, and when modified by other ingredients, still takes a place in the strongest and richest perfumes of London and Paris. The drug musk is extracted from its secreting pouch in the hinder part of the animal. It is said to have so powerful an odour when freshly obtained, that the hunters require to protect their mouths and nostrils by bandages, to prevent them from inhaling the vapour of the wet musk, which is apt to cause violent hæmorrhage from the nose or lungs.

The musk-deer is an innocent-looking animal, without horns, but has long canine teeth of very singular form in the upper jaws. It is a little smaller than the roebuck, and lives only in the mountainous regions of central Asia, where it wanders amongst eternal snow. It is covered with a hair-like fur, which stands erect from the skin in the attitude of defence against the cold.

In musk-deer we see a type of those fair nations, who occupy the Hindoo Couch and Boutan, which is believed by some ethnologists to be the ethnic-centre of the Indo-European race, from whence they have migrated to Western regions. In like manner the perfume musk, is diffused towards the West. The choicest perfumes from all parts of the globe, are concentrated in Western Europe, from whence they ascend to Heaven; typical of the character of the faith of this region of the world, which has culled the sweetest blossoms of Morality from the entire Earth.

Musk cannot be obtained without causing the death of the animal, and in like manner some nations and individuals, must die for the good of the greater number of Mankind. Musk typifies power, which in Great Britain to be *endured*, must be divided and dispersed: yet this very Diffusion contributes to the Glory of the World. Not so brightly as if it were reduced to a focus, which would be too intense a light to suit modern eyes. This is the reverse of many Oriental countries, where *centralization* prevails, and all power bends thereto. Spices and drugs must be in the strongest and least diluted form to please the appetites of natives of the East.

The common sloth or Ai (*Bradypus tridactylus*, Linn.) is amongst the most simply constructed of quadrupeds, and its intelligence is of a very inferior kind. It passes its life in dull but sluggish content. Its structure however is eminently adapted to its habits, and it moves with great facility among the trees in which it lives, and where it is quite at home; but on the ground

it is clumsy and awkward in its movements. It sleeps most of its time. It possesses immense muscular power, and its body is so flexible, that it can roll itself up into a ball, so as completely to conceal the head. In this habit it resembles some perching birds, and has other points of analogy with the class *Avis*.

Sloths are not entirely destitute of teeth, but as they have fewer than most quadrupeds, they cannot masticate their food, but merely bruise or break it. They are very tenacious of life, as is general with most animals of languid circulation and inactive habits.

The sloths show an analogy with men of the Bilious-lymphatic temperament, who usually require more sleep, and are more difficult to rouse than those of a more sanguine temperament. Sloths like a snug, warm covering over their powerful muscles. They are not easily killed by wounds. These peculiarities of constitution and disposition, are observable in several tribes, who inhabit the Basin of the Amazon.

The armadillo a creature confined to America, is remarkably protected by its extraordinary covering, which is peculiar to it and one or two animals of the Edentata. We are inclined to accept this class, as representative of *effete*, indolent natives, of the New and Old World, who have lost their *natural weapons*, and are reduced to defend themselves either by artificial restraints or defences; that so encompassed they may escape, or ward off the attacks of their stronger neighbours.

The six-banded armadillo (*Dasyus sexcinctus*) is a burrowing-animal of nocturnal habits. It is omnivorous, feeding on vegetables, young birds, reptiles, and the carcase of any creature within reach. It is by no means wanting in a certain kind of sagacity, which enables it to avoid danger. When roasted it is thought excellent for the table by the Spanish and Portuguese-Americans, who in like-manner consume the substance of the weak and nearly helpless aborigines. To avoid such a fate, they are glad to retire into the interior of their country; in which they would rather "bury themselves" than encounter their destroyers. But such a course is often vain, although the luxuriant forests may cast around them a protecting shade, which is a defence more complete, than the armour plates of the armadillo are, against the smaller beasts of prey.

The great ant-eater (*Myrmecophaga jubata*) otherwise called "the ant-bear," from its peculiar, hugging propensities and rough fur, is a native of the forests of Brazil and other parts of South America. It assists in maintaining the balance between different orders of animals, by devouring multitudes of a class of creatures, which otherwise would commit alarming havoc, even in the luxuriant basin of the Amazon.

It digs holes in the ant's nest with its powerful claws, and inserts its long tongue, with which it collects the ants with amazing rapidity. Most parts of its body are almost impervious to the attacks of these insects.

In most countries, classes or individuals are found, whose principal office appears to be, to keep in check other divisions of the community which are especially injurious. In Brazil, the Cayopa Indians are useful to that country, although like the ant-eater unwilling to work except on their own account. They are also more "rough and bearish" in their manners than some tribes; and may give the traveller who intrudes incautiously into their dwellings, a somewhat savage reception.

The manis or pangolin (*Manis pendactyla*), is the representative of the ant-eater in India and Africa. It resembles a lizard in general outline, and its scales are also somewhat like those of a reptile. It has a habit, when attacked, of throwing itself on its side, and crushing any object within its reach between its head and tail. When coiled up in this manner, it is invulnerable by most animals of prey; it is even said to be capable of crushing the trunk of the elephant, or the paw of any wild beast, and its scales are said to be harder than any other organic substance.

The Santals or Bheels of India, are low tribes without any caste, and are compared by the superior classes with the reptiles on which they feed. These tribes are by no means contemptible enemies, and are valuable friends, for they may be induced on an occasion to turn their strength against our rebellious subjects of higher tribes, whom we may compare with the elephant and tiger. They are a somewhat excitable people, and require to be judiciously dealt with, for they are prone to resent attacks.

What was said of the scales of the pangolin by the early writers, is true of the disposition of the Bheel nation. GIVE THEM A BLOW WITH THE SWORD AND THEY WILL FLASH FIRE.

The Marsupialia or pouch-bearing animals, are eminently characteristic of Australia, and we are inclined to think this peculiar fauna typical of the character of the native human inhabitants.

In the dog-headed zebra-wolf (*Thylacinus cynocephalus*) we see a representative of the predacious, cruel, and bloodthirsty character of the late aborigines of Van Dieman's land; who were so nocturnal in their habits. The eyes are large, dark and full, and the expression sinister, heavy, uninteresting and savage in this animal and its prototype.

In the flying *Petaurus sciurus*, so pretty and delicate in form and colour, we see an approach to what is agreeable and lively

in more favoured races. Proving that Australia, although its general fauna has a gloomy character, yet has somewhat in common with more cheerful lands.

It is become the focus of the civilization of the Southern hemisphere, in harmony with which the fauna is undergoing a change.

The fur of this animal, which is likewise called the squirrel-opossum, is used by such of the blacks of Australia as see the necessity for a scanty clothing; which may prove that some modesty, small in degree though it be, is still left to them.

The kangaroo-rat (*Hyprymnus murinus*) a thieving, poking, rooting little animal, does much injury to the vegetable gardens of the European settlers. The natives of New South Wales have similar habits, and are like this animal of a mean, cowardly disposition.

The kangaroo belongs to that division of Marsupials, which contains the largest animals. Some species reach a great height, and are doubtless the largest land-quadrupeds known in Australia. They are not formidable unless when attacked, but they can with their powerful hind-toes, give severe, backward, ripping-scratches, which are capable of disembowelling the largest dog. The kangaroos represent the aboriginal Negrittos; and their back-strokes, those of the boomerang. It is the noblest quadruped in Australasia—see how erect it stands! how cleverly it leaps!—but its intelligence is of a low character.

The wombat (*Phascolomys wombat*) has fur, like that of a bear; but in outline it resembles the *Hyrax* or coney of Scripture and the badger; and like the latter it remains all day in its burrow. This is the only animal in Australia and the neighbouring islands, which has the faintest resemblance to the bear; but differs in belonging to the Marsupial class, and in being of a mild, harmless and noiseless disposition; for it hisses rather than growls when angry.

The blacks of Australia can but little resist British progress. Their attacks on persons and property are ill-organized, and benefit them little; and their best defence is a feeble but frantic struggle.

The porcupine ant-eater (*Echidna histris*), is entirely destitute of teeth, but is covered with spines like the hedgehog; and like that animal can coil itself up into a ball, and show a front of sharp spines on every side, which defies the attacks of a ferocious dog or zebra-wolf. Its food consists of ants and small insects. Were it not for its shield of spines, this creature would be helpless against the attacks of its enemies; and the aboriginal population would be in a similar condition without their arms. It is infinitely inferior in size and strength to the

pangolin of India, or the ant-bear of Brazil; and its human prototype is inferior to the wild tribes of these countries. This shows how true the analogy is, between the less vigorous fauna and the human inhabitants of Australia.

The duck-bill (*Ornithorhynchus paradoxus*) is a sufficiently curious creature to excite the attention of the most common observer. It is one of the most important links in nature, connecting the quadruped and the bird; for it reminds us at once of the otter and the duck.

The Marsupials in their mode of propagation, *resemble* birds. Their young are expelled in a most rudimentary condition; and are afterwards developed in the pouch of the mother, which we may compare with the *bird's nest*. The Marsupials, whose young are not covered with a *placenta*, belong to the lowest division of Mammalia. Their predominance among the quadrupeds of Australia and its adjacent islands, is typical of the degraded human inhabitants of these countries. The little "duck-bill," is the lowest individual of the class of pouched animals, and its *shovel-bill*, reminds us of the apparently deformed lips, of the extreme type of the natives of Sydney.

Those who pursue and capture whales, if they benefit themselves also contribute greatly to the comfort of the world. Whales collect the riches of the Sea which would otherwise be greatly lost to man, but amassed in their bodies become a valuable material for his use. They have their analogy in such seafaring nations as the Scandinavians, who "suck of the abundance of the seas," and whose labours are so valuable to the rest of mankind. The Scandinavians furnish us with oil, to illuminate our dwellings and lubricate our machinery. They likewise greatly enlighten us by their inventions, and assist us by their applications.

These "sea monsters draw out the breast and give suck to their young ones," by which they show a great advance on the oviparous fish, which after they have spawned, leave their progeny to shift for themselves. Scandinavians are eminently distinguished for the strength of the parental tie.

The immense thickness of the whale's skin, renders it less sensitive to cold than other warm-blooded animals. In like manner these nations before mentioned, being often fat, are capable of withstanding great cold. Fat is a highly carbonized substance, which contributes as it is consumed, to maintain a high temperature on the surface of the body. Fat men do best in cold, and the lean and skinny, for the most part in hot weather, and the same is the case with animals in whom "the blubber" is thickest.

We are inclined to think the true fish typify the "Ichthyophagi" or Finnic ("Hyperborean") races, while the whales represent those nations like Scandinavians, who resemble them only in habits.

Whales are provided with apparatus specially adapted to enable them to descend into the greatest depths of the ocean; for their tough blubber-like skin, *only* increases in density and strength by enormous pressure, under which the shark or other true fishes, could not for a moment exist. Their blow-holes resemble in texture vulcanized Indian rubber, which gains in strength and solidity in proportion to the pressure exercised on it.

The Scandinavians only gather strength and greater powers of resistance as they are opposed; while nations differently constituted are crushed.

The whale respire pure air, and can only breathe on the top of the water. The Scandinavians are a frank, open people and hate to act beneath the surface, only breathing freely when they are "above board."

The fish-eating Finns were anciently confused with the Scandinavians, who were thus degraded to a level with them. The whales were formerly classed with the fish, but now they are elevated to a place amongst Mammals, and the Scandinavians to a position in the highest family of man.

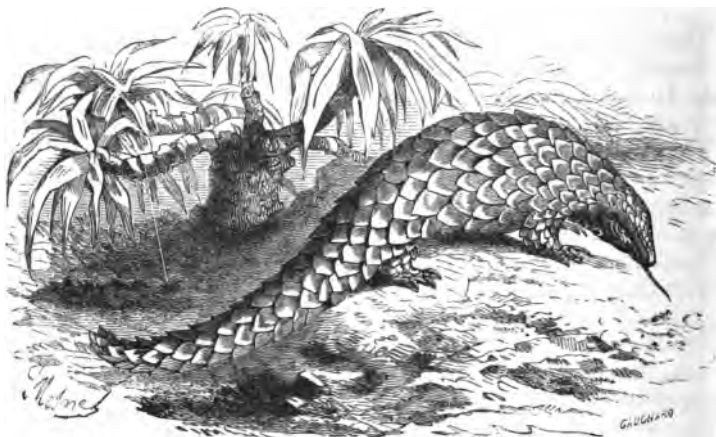
The dolphin (*Delphinus delphis*) a favourite with the poets, is mentioned by classic writers. It was supposed to have a sympathy for mankind, and was said to have been led captive by Arion, being attracted by his music. The dolphin is an extremely swift and graceful swimmer, and its form would be a very good model for a canoe intended for fast sailing. The dolphin follows ships for the sake of devouring the refuse. Its flesh was formerly reckoned very palatable, and is even now occasionally eaten.

It is pleasing to see them sport round a ship, leaping completely out of the water, and cut through the surging waves, surrounded perhaps by a wreath of foam, reflecting rainbow tints; their bodies bending at the same time, and displaying the greatest variety of contortions. They swim so rapidly, that notwithstanding their labyrinthine course, it is little effort to them to keep up with a fast sailing ship. Like the whale the dolphin is killed with the harpoon, which pierces its body and opens its veins. The agonized creature dives, carrying the weapon with it; but must soon rise to the surface to breathe. There it encounters its enemies, who wound it a second time. It struggles fearfully as its red blood tinges the waves.

The dolphin presents an analogy with the mariners of the

Mediterranean, who are the descendants of classical nations, some of whom repose upon the reputation gained for them in ancient times, which is not now justly maintained. This resembles in authority and value the fables related of the dolphin. We pronounce the names of localities in Greece, and ask "if their inhabitants are the descendants of heroes?"—"No!" Their glory is departed, and has not even left the hues on the horizon, with which poetry surrounds this animal's death; but whose beauty belongs to the Coryphene; an animal of a different class.

On a careful comparison of the Greece of Heroic and classic ages, with the Greece of modern times, we have been led to inquire, whether the glory of the Greece of ancient days, was influenced by a *small element* in the population, perhaps of



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foreign introduction, who were the columns of the state. When these props were destroyed, the temple of the nation's greatness became a ruin.

Unless we accept some similar hypothesis we cannot account for the decadence of that eminent country. Were the great men of our nation to be cut off by battle, pestilence or civil strife; if their sons lived, would they not be the representatives of their fathers?

The Greeks of the present day, like the dolphin, show great flexibility, and have no difficulty in following the track of our traders, and keeping up with them, for self-interest guides their course.

The porpoise (*Phocæna communis*) is a frequent visitor to the shores of Britain; and rolling and tumbling after its prey in a



PURSUIT OF THE GREENLAND WHALE.

grotesque manner, drives away the smaller fish from the shores.

The primitive signification of *Nise*, the Norwegian name of this animal, is *goblin*; probably alluding to the terror it inspires in the shoals of herrings. It is wonderful our fishermen do not pursue them wherever found, as enemies to the success of their craft, as well as for the sake of the large amount of oil they contain.

The porpoise typifies those nations who poach on British fisheries, destroying multitudes of our finest fish, and who toss over the waves in the most impudent manner near the coast. Our fishermen and "coast guard," have at some periods not cared to pursue them, unless they approached very near to the land. This want of vigour in the protection of our fishing interests, sometimes excites the ridicule of foreign nations. "John Bull" does not get the credit of good-nature on these occasions; but his indulgence in allowing the typical French hogs (*porcs poissons*), to fish in his waters, is attributed to weakness. With the law on his side he can always legally capture the poaching fishers.

The grampus (*Phocæna orca*, Cuv.) of whose ferocity fables are related, is said to attack whales many times its size, and worry them in a cruel manner, until they in terror open their mouths, when the grampus darting on the whale's tongue, tears it out and devours it.

The grampus we consider typical of the Normans, who were more than a match for the Frankish Gauls and Bretons, illustrated by the hog-fish; and even took up their station on the soil of England—the body of the "bull-whale."

The Norman conquest by no means permanently *tore out our Tongue*; but it was *held* for some little time, until the "Norman grampus" had to hold its own.—This took place when the Norman-French, was replaced by the language of Racine and Molière.

The bottle-nosed whale (*Hyperoodon, Butskopf*, Lacép.) which sometimes makes its appearance on the northern coasts, has a curious beak-like mouth, and is stouter, longer, and wider in the body than any of its class.

Dutch mariners are generally believed to have long bodies, short legs and noses which show a "progressive development" towards the Schiedam flask, if not in actual form, still in type; for grog loves to illustrate itself in this organ.

The Narwhal or sea-unicorn (*Monodon monoceros*, Linn.) is the prettiest of the whales, but has been accused of making attacks on the great Greenland species. This is not probably the case, for the animal having no teeth for biting purposes, it is difficult to understand how it could possibly prey on a living

whale. The curious spiral horn which it possesses, is its only developed tooth, but another exists in the jaw in a rudimentary state, which however in some cases assumes the form of a second horn. Its food consists of sea-blubbers, and other soft creatures, that require little mastication. It probably uses its horn as a weapon of defence, but rarely attacks other animals, although the older writers considered it ferocious.

The sea-unicorn typifies the pushing power of the northern nations, who have notwithstanding lost their former fierceness, and do not now attack others without provocation. Such are the Danes and Icelanders, who are the descendants of "the Sea Kings," and whose offspring in other lands, have so much weight and power in the present day. The single horn of this animal represents the proper position of the Scandinavian kingdoms ;— they should be ONE. The double horn illustrates their *abnormal* state of division.

The cachalot or spermaceti-whale (*Physeter macrocephalus*) only next in size to the rorqual amongst existing animals, yields some important articles of commerce. The principal of these are a rich oil which is separated into spermaceti or pure stearine and spermaceti-oil, and the curiously anomalous substance ambergris, found in the intestines as well as in other parts of the body. It is even sometimes found floating on the surface of the sea, at a distance from the whale. This creature swims with great swiftness, and is believed to live to an enormous age, probably far beyond that of any other animal.

Its food consists principally of cuttle-fish, which according to Mr. Beale's supposition, enters its open mouth as it reposes, being attracted by the white teeth. That its prey is obtained in some way where sight is not required is certain, from its often being found blind. Others are found with the lower jaw deformed, and yet are otherwise in as good condition as perfect animals. The teeth are not used for mastication, for the prey is swallowed whole.

The struggles of a wounded sperm-whale are often tremendous, and endanger the lives of boats' and ships' crews. A period of breathless anxiety passes after the whale is "struck," lest it should escape or injure the crew. It is first attacked with harpoons and ropes, and finally killed with long lances. But before the whale expires, it discharges its blood in great abundance, through its wounds and blow-holes.

The sperm-whale typifies some great corporation or public company, whose wealth sadly tempts the cupidity of the enterprising but unscrupulous. Like the whale it is usually far too large to be the prey of one spoiler, but may make many wealthy. Its enemies like those who pursue the sperm-whale,

represent many different classes in society. When they see a Joint Stock Company in a state suitable for attack, there is as great an excitement among them, as there is on board a ship in search of these animals, when a whale appears in sight.

When a whale is seen, boats are put off in search, manned by a swift oarsman; but often before it is reached the animal plunges into great depths, for instinct tells it to avoid the presence of man.

This conduct of the whale, reminds us of the first rebuff usually given to those, who would interfere without authority, in the affairs of a public company.

The boat's crew watch a long hour for the appearance of the whale on the surface of the water. It rises, and they start in pursuit. As they approach the vast animal, a sharp barbed harpoon attached to a long rope is thrown with great force into its back. It writhes in pain, and instantly descends, carrying with it the harpoon and the line attached. It remains a shorter time under the water than it had previously done, for it is much weakened by loss of blood.

The harpooning of the whale, represents the first opposition to its onward progress, which a public company receives from its enemies.

The whale is harpooned a second time and again descends.

This second stabbing process, may represent the board of enquiry into the conduct of the directors of the company; and the downward course of the whale may illustrate the falling state of the concern.

When the harpooned whale rises a third time, it is lanced; which is typical of the final decision of "the Board." The execution of this decision, is illustrated when the last struggle is over; which however does not take place, like the whale's death, without "a great struggle," when all concerned in the process, may be "sprinkled with dirt."

The final division of the carcase is done regularly and legally, like that of the affairs of a public company, by the supreme authority of the Court of Chancery. That body strips the company of all its property before they have done with it.

After the whalers have extracted from the whale every thing of value, they cast it *adrift*.

A sperm-whale may be again likened to a Friendly society, which has done much mischief to small capitalists.

This species mostly feeds on blubbers, mollusca and a few small fish, which attracted by its white teeth enter its mouth. They may represent the artisans and petty tradesmen, who are caught by the "bait" of good interest for their money, held out to them by the society.

The spermaceti in its crude state, typifies the capital which the company has made its own. That fluid consists of two principal ingredients; olein and stearine, which may illustrate, "present and deferred annuities;" while the ambergris, which some think has a putrid and stinking odour, is like the "burial fees" paid by the society.

The Greenland whale (*Balæna mysticetus*, Linn.) is the creature that yields whale-bone, and the greater quantity of the whale-oil of commerce. The gullet of this whale will scarcely admit a man's hand, and consequently its food must be of a very small size. It consists of minute mollusca, crustacea and medusæ, which float near the surface of the sea in amazing quantities. It collects these in its vast mouth, and closing it over them allows the water to escape through its plates of whale-bone, which retain all the animal matter, to be sucked down the whale's gullet as through a funnel.

The whale's greatest enemy is man, but it has also foes among the fishes of the northern seas, such as the arctic shark (*Scymnus borealis*), the thresher (*Carcharias vulpes*), which hits the whale powerful blows with its tail; the sword-fish (*Xiphias gladius*), and the saw-fish. Several species of birds also are quite happy to take a share in despoiling its carcase.

The whale's only means of preservation is in its power of retiring into the depths of the ocean, where the structure of its enemies would not allow them to follow it. It is a type of the British constitution, hundreds of years old as whales are supposed to be. It is a cumbrous, bulky corporation, and is certainly more easy to *attack* than to defend, except on the ground of its utility.

The threshers which attack the whale, may typify foreign enemies. The sword-fish which *stabs from beneath*; the "Radicals." The saw-fish those who attack it from the other side of the Atlantic, and only want the power to cut it in two.

In the numerous sharks which only follow the whale for what they can get, we see a resemblance to some of the allies, who would gladly see the British empire divided,—if they could benefit thereby.

If the British nation is only true to herself, she may like the whale retire into the recesses of her home, and be there indifferent to her numerous enemies.

The Greenland whale and several other species, are infested by parasitic barnacles (*Coronella diadema*), but these are apparently unheeded by it. These may represent the blemishes in our Political system which we must not however attribute to the CROWN.

The rorqual (*Balenoptera boops*, Flem.) the vastest of living creatures on the globe, of which we have knowledge, is swift, active and watchful compared with the Greenland whale. Its pursuit is so dangerous that the bulk of whalers do not attempt its capture; but the Scandinavian fishermen of the north, the most enterprising in the world, do not hesitate to attack it.

The rorqual is less valuable in commerce than other species of whales. It is a type of institutions which are of comparatively limited importance such as the corporations of London and New York, which however tempt the envy or cupidity of legislators in both countries. The corporation of London was attacked in 1863 by an important "bill;" but like the wounded rorqual it floundered, and calling on other corporations for aid, "broke its enemy's line" and escaped. It is probable that it will be allowed a long respite. The enemies of corporate bodies like those of whales are mostly the people of the North.

CHAPTER XIII.

THE CHEMICAL ELEMENTS TYPIFYING MAN.

THREE STATES OF MAN—MAN A TRINITY—THREE KINGDOMS OF NATURE—
 EMOTIONS CONNECTED WITH CORPOREAL ORGANS—FOUR ELEMENTS AND
 MODERN ELEMENTS — PHRENOLOGICAL FACULTIES — TEMPERAMENTS —
 OXYGEN — HYDROGEN — CARBON — NITROGEN — METALLOIDS — ALKALINE-
 EARTHS — IRON — LEAD — ZINC — COPPER — MERCURY — GOLD — SILVER — AN-
 TIMONY — PLATINUM, AND ITS SATELLITES — ELEMENTS TYPICAL OF MAN'S
 ACTIONS AND CHARACTER — AMMONIA — NITRIC-ACID — SULPHUR — PHOS-
 PHORUS — IODINE — BROMINE — FLUORINE — POTASSIUM — BARIUM — STRON-
 TIUM — SULPHURIC-ACID — LIME — MAGNESIUM — ALUMINUM — GLUCINUM —
 THE PRECIOUS STONES.

MAN is a unit ; but a trinity standing in one figure. His states are three ; Living, Dead and in Resurrection.

Mind analyzes itself as well as what surrounds it, and naturally applies the same principles in considering both :—the method of analysis is similar. We believe in Man as an Unity, and in the World as an Unity ; and that these "unities" act through different portions or divisions, specially allotted to various functions. These functions often, properly belong to the same element or part ; yet great divisions exist. Thus if we admit Three Kingdoms in Nature ; the *Inorganic*, the *Organic* and the *Moral*, so we subdivide these "Three" again into *elements* ; remembering at the same time, that absolute isolation among the elements, analyzed and separated by modern chemistry, is as impossible, as the absolute separation of divisions, species and individuals, is in the Organic Kingdom. The same law applies to the individuals and functions comprised in, or under the influence of the Moral Kingdom.—All are connected and hang on each other.

These three grand divisions ; "the Moral," "the Organic" and "the Inorganic," illustrate one another, fill many gaps, and form bright bridges, on which we can cross those dark clouds, which have for ages obscured the outlines and main principles, of the "System of Nature." We therefore use these great divisions, these Great Empires to illustrate each other.

The TRIAD-UNITY Man, with his Organic section capable of decay ; with his animal life, and with his spiritual life,—“his Body, Soul and Spirit” illustrate each other ; they are all analogous to the great Empires in Nature ; unities that may be analyzed, but cannot be wholly divided.

The soul of man is the union of his *spirit and his* BODY, and expires at his death, which is but *disunion* : it is during life a type of bestial or Organic life.

After death man consists of but *two* sections ; the spiritual which is flown, and the Organic, which by dissolution becomes *Inorganic*, and can never live again ; although the Man may. These two last-named divisions, may again be contrasted with the “Organic” and “Inorganic Empires of Nature.”

Man's body is a *Unity*, and yet we divide it into Different parts or Organs. While we admit the apparent occurrence of “local disease,” yet the body smarts from head to foot at the least touch on the most distant extremities, of any disorganizing influence. The more Man is in health, the more is he cognizant of this TOTALITY.

The ancients allotted different classes of mental emotions to different parts of the corporeal system. Thus the bowels were the seat of the Domestic affections and kindly feelings, the head of the Intellectual faculties, and the heart of the Moral faculties and propensities. The spleen presided over satire and vindictiveness, while the liver was devoted to melancholy, and the gall influenced that bitterness for which there was no cure.

But now the system of man is found to be representative. His head is not merely in the position of ruler, commander and governor of his frame, but it is the focus of his light, and presides over *all* his emotions, sensations, observations, and every function exercised by the smallest organ of his body. It is his “godhead” as contrasted with his corporeal trunk and extremities ; which comprehend but another view of his Tri-unity.

The brain is the great centre of life and function, every operation being performed by it, through the agency of the more local organs which “serve mere engines to the ruling mind.”

The idea of the ancients had a considerable measure of truth. The connexion between the exercise of different emotions and that of particular parts of the body, is assuredly to be traced in a close and corresponding manner.

Man consists of three great unities, all exercising a variety of faculties or functions, which *united* make the Man. His body consists of many parts or organs. His mind which we shall at present call his “Animal life,” acts through different corporeal organs which we discover by comparative observation :

—this is his Soul. The *Spirit* is the type of *all*, and acts through all ; but can exist alone.

The Spirit of Man, the offspring or emanation from GOD, is not the result of *Creation*, but is Immortal, and its presence in individuals is dependent on the will of the Creator. The spirit is the seed of man, which proceeding from Man and sown where he decayed, springs up "A NEW MAN." This is what is usually termed "resurrection," which is but the completing or perfecting of man for his start on a future life. The seed of a plant, in proportion as the germ springs from it, decays; the Elements of its growth being derived from the Decaying matter of the seed, the earth and the air : therefore it dies, as every object must, to rise higher.

The soil of earth may be here taken, as the original framework into which life is placed. The chemical processes of decay and sustenance, illustrate further growth, after the start given at first creation. We may venture on these remarks, from their being in harmony with Resurrection, which is probably a process similar to that of creation.

It is evident that beings who have once lived ; must be in their second or renewed life (even if we call it "a new or *Re-creation*"), in a very different position, from those born for the first time. Those born for the first and second time may be contrasted with each other and with Primeval-Creation.

Vitality is the Offspring of God. It was bestowed on Adam; but given also in a different manner, in a different degree and in a different form to all organisms. Therefore all life "is the Offspring of GOD;" but that of the lower Animals and plants, does not possess that *immortal individuality* exclusively reserved for Moral Beings. Not even perhaps a specific immortality, still less a racial immortality ; but a generic, classic and typical immortality. This last is the most inclusive and certain of all resemblances between the New and Old Creation; our lives in this world being eminently illustrative of the future. An analogy which we believe will be carried out, through and between all surrounding objects in both Worlds. But we must bear in mind that many things that are allegorical and figurative in this world, will be real and substantial in "the next," and the exact reverse, for many things that are real in this world, will be typical and figurative in the Next.

Creation was progressive ! The age *characteristic* of plants, was succeeded by the age *characteristic* of animals, each rising higher than the preceding ; each dying away, till man appeared higher than ALL ; who must expire to "Put on Immortality."

Man's fall was typified from the earliest creation of matter, from the time when the "Elements began to move." Their

disintegration to take part in higher combinations, typified his fall and progress. The creation of the lowest plants and animals, constructed of these elements and their continued existence, involved disintegration:—THE LOWER FORMS MUST FEED THE HIGHER. The lowest plants and the lowest animals died to feed the higher; the highest plants and the highest animals died to supply food and satisfy the wants of man. His body dies that his spirit may attain a higher rank; it decays, that out of its ashes may spring a man of a higher order. Thus death began as soon as life. It was as necessary to the maintenance of life as of progress. Lower races pass away that higher may succeed, even of Man's imperial family.

The different organs in the trunk, typify these faculties of the mind or portions of the brain, through which the mind can alone act, and by which we in general understand what the phrenologists mean by the term "Faculties."

The Mind of Man *is his Spirit acting through his phrenological faculties*, by which he can alone receive and communicate impressions during his present life. His life hereafter, being that of the same Mind, must preserve the same class of functions; during death in a dormant state, and in resurrection in a state of renewed and increased activity.

To imagine Man without a body is difficult; and it is certain that he would then be unable to act as a perfect being.

Inorganic chemistry, the first or most primitive branch of knowledge, is the earliest history of the Earth, the foundation of physical science, that gives us a faint idea of the formation of the primitive rocks, which form the basis of the later strata.

There was not a time when there was no *rule*, and therefore Moral law must have been the parent of physical law.

We may for a moment give the *physical* the first place; but the Moral is the earliest in date and the highest in reality. Such was the FIAT of the Almighty;—The Creator of the Universe.

The tendency of man's mind as he progressed in civilization, was to inquire into the "first principles" and "elements of things;" but he has hitherto been a child, and "children" can grasp but very little. He stumbled on "Four Elements," which represented to his mind the composition of the earth. This division was a step towards System in matter, and any system is better than none; for its very defects, its very rents, are holes which call for Mental exertion to patch. In time the "old garment" wears out, but the skill acquired in "patching it," and the old materials, assist in constructing a new one. This false system, this net of rags has kept together pieces of gold, which the philosophers of old time, have hoarded for the "heirs of science."

In like manner those who studied man from the days of Galen to our time, separated his system into parts or temperaments, which were frequently divided into FOUR. Thus there were the Bilious or melancholy, the Sanguine or Choleric, the Phlegmatic, Lymphatic or fleshy, and the Nervous or Mental. That these divisions do exist is certain, but they are only rough divisions, such as are used when we say that the world "is divisible into Air, Earth, Fire, and Water." The FOUR TEMPERAMENTS of Man, are all comprised and included in the organization of the Faculties of his Mind. They indicate his Temperament *exactly*; and, with far less precision—it exhibits the proportion in which he possesses all the faculties common to Man.

So the division of the World into "Four Elements" is but a rough and primitive method of treating a vast subject. The modern elementary system is much more precise in its analysis. The old arrangement divided substances into solids, fluids, gases and forces; or what we see and of what we are cognizant. Modern science would consider these "forces" not entitled to a separate class, but as the result of the action and functions of elements.

Physiologists have likewise ceased to reckon one of their Temperaments. Thus we have now but *three*, which answer to the solid, the fluid and the gaseous amongst bodies. They are classed as the MOTIVE or Muscular, the most solid; the SANGUINE or VITAL, the most fluid; and the NERVOUS or MENTAL, the most ethereal, elastic and excitable.*

We propose to show the analogy existing between the elements of modern chemistry, and the Faculties of Mind analyzed by Phrenology.† The elements which chemistry recognizes,

* Fowler.

† As an exact analysis of the "PHRENOLOGICAL ORGANS" is possessed by few persons who are even acquainted with the outlines of the science, it may be well for the sake of the more perfect comprehension of the analogy which we have drawn, to give a short sketch of what the author and most phrenologists understand by the use of the following terms, some of which have undergone some slight change in signification.

The first we shall speak of are Intellectual Faculties.

INDIVIDUALITY observes facts, names objects, treats subjects in reference to their details, and is the pre-eminently "Observing Faculty," though one of many.

FORM, notices the configuration of objects.

SIZE observes the proportion of objects.

WEIGHT notices the gravity of objects, and greatly controls the touch.

COLOUR observes tints.

LANGUAGE gives facility in expression, or the repetition of words.

NUMBER is the principal faculty which assists in numerical calculation.

LOCALITY notices the position and relation of objects.

ORDER assists in arrangement.

TUNE appreciates the qualities of sound.

TIME notices the lapse of time, as between sounds.

EVENTUALITY notices the connexion between facts; it is the chronicler among the faculties of the mind.

illustrate the primitive faculties of mind, and are sometimes entitled to be classed in a diverse manner. They are both basic and active; the grammarians would say, "are both objects and agents."

The present state of our knowledge does not admit of our finding elements and phrenological faculties which correspond in every case. Some clearly represent one another, while a few, perhaps from our imperfect knowledge do not show so close a resemblance.

The Non-Metallic elements generally, are types of the Observing faculties, of which the most important is Oxygen. It stands first as "the keystone" of all, taking the same place amongst them, that Individuality does among the observing faculties. Oxygen is the great stimulant, as well as the great destroyer of life. Individuality is the great sustainer and quick-

CAUSALITY inquires *why*, and deduces *the cause* from the Effect.

COMPARISON compares, analyzes and assists **CAUSALITY** in the reasoning process.

CONGRUITY (*wrongly called* "Mirthfulness" and "Wit") is the faculty which notices the harmony between subjects and objects; consequently greatly contributes to wit, which is so closely connected with the strain of harmony.

ALIMENTIVENESS discriminates the qualities of food.

We will secondly speak of the Domestic Propensities.

PHILOPROGENITIVENESS or **PARENTIVENESS**, is the faculty which presides over the relation between parents and children, a sentiment answering to it is the soul of the Paternal government in Nature.

AMATIVENESS relates to what is sexual, to the entire class of sympathies between the sexes.

ATTACHMENT or **ADHESIVENESS**, is the organ which has most to do with friendship.

CONCENTRATIVENESS is connected with the power of reducing things to a centre, either with relation to locality or study. We think with Combe that "Inhabiteness" is but **CONCENTRATIVENESS** exercised in connexion with places.

We will thirdly speak of the Selfish Propensities.

DESTRUCTIVENESS is the propensity to destroy, but in human character it is frequently shown in acrimony, satire and the love of reform.

COMBATIVENESS is the opposing faculty; it knocks down and **DESTRUCTIVENESS** stabs; but Courage and fortitude greatly depend on this first-named faculty.

FIRMNESS is the stable and controlling faculty which directs the other emotions of the mind.

SELF-ESTEEM is connected with the opinion of self, as opposed to **LOVE** or **APPLAUSE**, or Approbation, which causes Man to value the opinion of his fellows.

CAUTIOUSNESS is opposed to **COMBATIVENESS**, by causing deliberation in presence of danger. It is the conservative faculty.

ACQUISITIVENESS occasions the desire for property as such; but **ACQUISITIVENESS** only grasps; **CAUTIOUSNESS** is required to retain.

SECRETIVENESS is the reserved, exclusive faculty which while it hides, perceives what is Hidden.

We will fourthly speak of the Semi-intellectual Sentiments.

CONSTRUCTIVENESS is the building, planning faculty, necessary to the architect, mechanic and artist; Human and Animal.

IMITATION is the copying, sympathizing faculty, which gives imitative power to man's mind, hand and tongue.

IDEALITY is connected with the love of the beautiful in Nature and Art, and with Design; Idea or conception.

We will fifthly speak of the Moral Faculties.

BENEVOLENCE is the human—the philanthropical faculty.

ener of the other observing powers; yet it may force them beyond their strength by too great stimulus, and so destroy their tone and function, and thus induce mental disease.

Hydrogen is the great former of liquids, few being without it amongst compound substances. It is a type of Language which causes our ideas *to flow*. The "observing faculties" as a whole, are more agents than rulers, they are not bases in general, but the means of using them. A few, such as Eventuality, have a basic action. This faculty is the great storehouse of the Mind, it is the fuel which supports Man's most brilliant thoughts; it is the great connector between his Reasoning and Observing powers. Its position is somewhat similar to Carbon, which is not so active in itself as some of the other elements, but forms the basis of the greater portion of the combustion on the Globe.

HOPE is the sanguine, aspiring, self-sustained faculty.

FAITH (wrongly called "Marvellousness" or "Wonder"), is the externally sustained faculty, as opposed to Hope, whose stimulating power proceeds from within. It is doubtless however connected with superstitions, as far as they relate to the unseen Spiritual World.

VENERATION is the faculty which leads man to respect higher powers and established usages and customs.

The faculties first analyzed by the Fowlers and the American school of Phrenologists, and considered by them *Primary Faculties*, the author believes to be *Semi-Faculties* or those which proceed from the union of Two PRIMARY FACULTIES. After considering the subject and comparing some hundred heads during many years he believes these organs to proceed from the approximation of two Primary faculties and to be indistinctly visible in a large proportion of individuals to such a degree as not to entitle them to be considered the corporeal organs of faculties common to Man. The author would therefore not yet give them a separate classification; but the subject cannot be yet fully decided.

"AGREEABLENESS"—considered by Fowler to be the faculty which promotes success in society, is probably the result of an approximation, between the organs of CONGRUITY and IMITATION.

"HUMAN NATURE" discerns the characters of men, and contributes to the management of men. It is the result of an approximation between COMPARISON and BENEVOLENCE.

"SUBLIMITY" which is believed to differ from IDEALITY by appreciating the grand, rather than the beautiful in Nature and Art, is the result of an approximation between the faculties of IDEALITY and DESTRUCTIVENESS.

"VITATIVENESS"—defined as occasioning an unwillingness to die, which varies in individuals, is located between COMBATIVENESS and AMATIVENESS.

The author believes it should be rightly included in the faculty of COMBATIVENESS—which resists death, as well as all things which oppose it; in opposition to DESTRUCTIVENESS. When "*Vitativeness*" is wanting it shows COMBATIVENESS to be deficient, so far as its opposition to DESTRUCTIVENESS goes.

"UNION FOR LIFE" is an organ which connects AMATIVENESS and ATTACHMENT; it unites the qualities of these two faculties to a great extent. It is also situated near where "*Vitativeness*" is supposed to be located, which we think significant of the desire for life, which accompanies the wish to be united to an individual of the opposite sex.

We may as well remark that all the PRIMARY faculties are common to Man; but the character of individuals is discoverable by a knowledge of the COMBINATIONS that exist in a man; for a faculty can never be isolated however much we may attempt it.

It is sometimes said that there are "good and bad bumps;" this is quite an error. All the faculties are equally good; but some are higher in standing than others.

Carbon as the basis of the most permanent ink in use, conveys to later times the chronicles of the past, and is in this sense a type of Eventuality the Historical Faculty, which in the mind of Man is the medium of the record of events.

The Metallic elements unite greatly with the Non-Metallic, as the propensities combine with the Observing Powers, forming in union, useful adjuncts to each other. The three Metalliods, Potassium, Sodium and Lithium are types of the faculties Causality, Comparison and Congruity. They act powerfully on the Non-Metallic bodies; as the Reasoning faculties do, on their Observing servants.

The elements contained in "the alkaline earths" such as Barium, Strontium and Magnesium, which occupy an intermediate place between the alkaline Metals and the "basis of the earths;" show some analogy to the position of the Semi-Intellectual faculties of the Mind; as it were half way between the Propensities and the Intellect.

The Moral faculties are entitled to the highest place, they are the gems that ornament the man, that are above rubies in price or the precious emerald and the topaz;* analogous to which are the elements contained in these stones. Embedded in an earthy matrix, they are like the Moral faculties which reside in "the clay of man." Aluminum is contained in the ruby and sapphire, Glucinum in the emerald and beryl, and Zirconium in the jacinth of Ceylon.

The elements and their combinations, display some analogy with the Faculties of the Mind and their mode of action. Chemical analysis shows most irregular results. Thus some combinations of substances are wholesome as food, while others, which contain the same Elements in different degrees, are virulent poisons.

The characters of men consist of combinations of faculties, which are *good* or *bad* according to their proportions. "But even the worst may be rightly used, and even the best may be abused." If the elements illustrate the primitive phrenological organs, so do the Combinations of these elements, the various acts and qualities which our Minds manifest in daily life, and which are so various in their effects according to time and place.

The true Metals, illustrate the Propensities among the faculties of the Mind. Iron the most important has long been considered a type of firmness from its hard and enduring qualities.

A "leaden-countenance" is the acknowledged accompaniment of a heavy, tasteless and gloomy disposition, too low-spirited for much exertion. This proceeds from a predominance

* Job xxviii. 18.

of the faculty of Cautiousness in the mind ; which keeps the individual in too great doubt to act with decision.

Zinc is sensitive to a lower degree of heat than most metals. A relatively moderate temperature is sufficient to render this brittle substance malleable, and a somewhat greater heat may cause an explosion. It is a type of the Love of Applause among the faculties, which contributes to sensitiveness, and when paramount in an individual, may render him highly susceptible of the influence of the "hot-tempered."

Copper has an unpleasant smell unless it is absolutely pure ; and is of a colour approaching that of gold ; but is of far less value. It is the principal ingredient in brass, the acknowledged emblem of assurance ; which in man chiefly proceeds from large Self-esteem.

Mercury or quicksilver is a metal difficult to grasp or retain, and is exceedingly subtle in its action. It was appropriated by the ancients to the god of commerce and thieves, whose callings require craft. It is the most artful of the metals, and assists in applying others ; escaping in a cunning manner when it finds its situation too hot. It is therefore a just emblem of the organ of Secretiveness.

Gold stands as a type or representative of property in many countries, and exercises most the organ of Acquisitiveness. The possession of gold like that of this faculty, excites the desire to increase wealth.

Silver is only less sought after than gold. We consider it a type of amativeness ; one of the most important and ruling of the propensities. Its lustre is pure like that of the moon on which "lovers wait." But Acquisitiveness sometimes predominates over Amativeness, and cupidity may supplant "Cupid."

The action of Antimony is similar to that of Combativeness ; it removes obstructions in man ; throwing up and down with great violence. The ancients called it "antimonk." It seldom destroys life so rapidly as Arsenic, but reduces the system. Antimony knocks down, but Arsenic is only satisfied when it entirely eradicates life : it is a type of the organ of Destructiveness.

The faculty in man, which gives to the action of every other increased strength and intensity, is Concentrativeness. It reduces the operations of the Mind for the time, to a small compass.

Platinum is one of the heaviest of substances and imparts its great gravity to those metals with which it is combined. It is the standard against which great degrees of heat are measured, or delicate variations in weight or bulk.

Tin is a common metal with a lustre like silver, which it re-

tains for a considerable time. The tenacity with which it holds Oxygen, may be compared with the affection of a devoted friend. In its highest degree of oxidization tin is an ingredient in enamel. When melted it adheres with tenacity to iron or copper, and is one of the principal ingredients in "solder" which binds metals together. Its action is similar to that of Adhesiveness or friendship, which unites man to his fellow. Friendship rightly applied, is an ornament to society: it is the great enameller and polisher in domestic life, and gives it not merely a temporary Lustre, but a permanent Beauty.

Palladium, Iridium, Rhodium and Osmium are like children of one family, being found together, and lying in the same *bed*. Platinum is their protecting-parent; but some of them are difficult children to deal with, for Osmium is the hardest of the metals. Such a group of metals show analogy to a human family, the object of the exercise of Philoprogenitiveness.

Some elements adhere together with great devotion, and are apparently united for life, only to be separated by the divorcing chemist. Such are Cobalt and Nickel which in ages past were *wedded*, and still cling together until torn away by furnace-heats; or acids and alkalis, over which they have no control. The friendship of Zinc for Cadmium is also of a devoted character. They have been called "twin-brothers," as their ores are often united.

Having reviewed the primitive elements as illustrating the elementary faculties of the Mind of man; let us consider how they are typical of his actions and character.

The Thirteen Non-metallic Elements; Oxygen, Hydrogen, Nitrogen, Carbon, Sulphur, Selenium, Phosphorus, Chlorine, Iodine, Bromine, Fluorine, Boron and Silicon, form the most important class. Sulphur that destructive substance, may well typify amazing power either for good or evil. It combines with oxygen in two important proportions, and forms the well-known sulphuric and sulphurous acids. The first which is highly oxidized, is the most powerful solvent known and typifies a divine-messenger. The second, inspired by a lower degree of invigorating oxygen, has a more decided odour of sulphur. It has much less power as an acid, but is fatal to animal and vegetable life. It is a type of a "wicked angel," for it resembles power in evil hands. Yet "good may be brought out of evil," and in like-manner this sulphurous acid will whiten and purify what is polluted, and render it wholesome and fit for use.

Oxygen is a great restorer, as well as a great destroyer; it reminds us of the "attributes of the Deity," who supports all

things, but who cannot endure impurity or imperfection. Carbon requires oxygen for its combustion, otherwise it cannot diffuse a genial warmth. Human energy unless under Divine inspiration, can accomplish little.

Hydrogen—one of the great illuminators among the elements, is the principal ingredient in water ;—a combination of this gas and the life-restoring oxygen. A mixture of these gases is highly explosive, and may destroy those who incautiously meddle with them :—such are the “Korah, Dathan and Abiram” among scientific men.—Those who are more reverent in their pursuit of science, escape.

The heat produced by the combustion of pure oxygen and hydrogen, is far greater than any known. It is a type of the “fire of God” proceeding from earth ; as the electric light is a type of the “fire from heaven.”

Nitrogen was formerly termed “azote,” being supposed to be destructive to animal life. It certainly cannot support respiration, but it is with carbon the principal ingredient in the nutrition of plants and animals. The deadly cyanogen, the basis of hydrocyanic-acid, is a compound of those two elements. Which indicates that what is most necessary when “rightly used,” to the support of life ; is when “abused,” the most fatal to it. Nitrogen is more unstable in its combinations than oxygen and is more characteristic of Organic Compounds.

Nitrogen—the chief constituent of most living-organisms, is a type of the facts derived from their study ; which contributes to nourish man’s mind. Carbon and calcium, alike illustrate the teaching man derives from the study of the animal kingdom. These remarks are not confined in their application to the professed students of science ; for the observation of natural objects is *universal* in man, who as long as he lives is influenced by them.

Ammonia, one of the most remarkable substances in Nature, is a gas composed of hydrogen and nitrogen. It resembles an element in many of its properties, but is at the same time a powerful alkali, corrosive to organic substances. Although so pernicious to animal life, the salts of ammonia are highly nutritious to plants. They are extremely volatile, and can make themselves invisible in a moment. Their presence can be felt when it cannot be seen. They are like the ghosts of those that are dead ; as they proceed from dead matter.

Nitric acid although not quite equal in strength, is as corrosive as sulphuric, oxidizing with facility either organic or mineral bodies. It forces the common metals to combine with oxygen, reducing them to powders or pastes, or entirely dissolving them, and only the “noblest metals” remain intact.

Strong acids like strong alkalis, destroy organic life ; but when combined they form salts, which are in many cases necessary to its support.

Acids have sometimes very terrestrial functions. They long wander through neutral ground, where they find no rest ; no kind, fair alkali, willing to unite her destiny with theirs. They at length reach her ; she may be black as smoke from impurity ; she may be white as snow from refinement. The marriage may take place as soon as they meet ; it may be a silent process, accompanied by little heat on either side, with little more than a change of name and appearance, or it may be a formidable operation, accompanied by great froth or effervescence. But when the excitement of so important a change is over, they settle into a useful family "of salts." They fulfil their destiny like good people, and perhaps serve to fertilize the next crop.

Sulphur is that yellow element, thought to be characteristic of the "Infernal regions ;" and it is surely brought from volcanoes, which the ancients believed to be "the mouths of hell."

Sulphur is easily melted, and readily adapts itself to any form. It is therefore much in request for taking casts and for making those indispensable articles, detonating matches.

In one case a female character well illustrated this element. Her complexion had a yellow cast. She was a great match-maker, but her "matches" were mostly lucifers,—her "marriages were not made in Heaven." Explosions followed the ceremony and brilliant flashes of temper which might be compared with the light on a phosphorus match. Although "touchy" herself, she appeared to enjoy these squabbles ; but at the flame of their wrath she sometimes "burnt her fingers."

Phosphorus is more irritable and easily inflamed than sulphur, and bursts into a blaze with a slight amount of heat or pressure. Its combination with oxygen is generally accompanied by an explosion, but it may begin in a smouldering fume, which has an odour worse than garlic. Phosphorus is injured by exposure to the light, and assumes a darker colour.

The human prototype of phosphorus, has a more violent temper than "the flowers of sulphur ;" and not to be behind her in love of mischief, takes a share in the manufacture "of lucifer matches." He is not to be trifled with, for his dull "fume" may end in a blaze. He should be kept in the shade, for exposure in a conspicuous place, would not only destroy his purity, but the little beauty he possesses.

Iodine—another element contained in the sea, is one of the most corrosive and powerful substances in nature, but of comparative rarity. It rots most organic substances, staining them as darkly as chlorine bleaches them white. The salts of Iodine,

particularly the iodide of silver, have played a most important part in those pictures which are the wonder of the age.

Bromine so named from its bad smell, is with the exception of chlorine, the most irritating and suffocating of the elementary bodies. Like iodine and chlorine, it takes an important position amongst the photographer's chemicals. The bromide of silver, being more affected by tints of green than the other sensitive salts of this metal, is much used in landscape photography.

Bromine is a type of those "Elves" that were believed to "dance on the green;" that were "*in bad odour*," but yet were supposed to give a charm to the woodlands.

Fluorine, is the most acrid, irritating and penetrating substance known; dissolving every mineral that contains silica, or any other "earth," and attacking every metal. Almost the only substance not corroded by it, is fluor-spar, already so saturated with it that it can hold no more. Fluorine is the emblem of an all-pervading influence like that of the Deity, all being destroyed by Him who do not accept HIM as a RULER. Like Fluorine He is invisible, defying analysis, but is known by His power.

Fluorine and its hydrogen acid, cut glass, and reduce the hardest rocks to a solution or a gas, melting them into "smoke," as do created things at the command of THE ALMIGHTY.

The division of the elements into "solids," "fluids" and "gases" is false and superficial, for fluorine dissolves the hardest flint into gas, and in contact with water it falls into powder or solution, when saturated with hydro-fluoric acid.

Boron and carbon are somewhat alike in properties; but boron is perhaps a nearer ally of that abundant element Silicon, for it has an intense affinity for oxygen.

God did not intend that "Man should dwell alone," neither did He intend that these elements should remain separate and divided. They are most difficult to isolate from their oxides, which the young chemist finds, in his desire to flirt with pure elements. He may succeed by a long and complicated divorce; but their disunion is only for a time. Whenever they are at liberty, they fly to each other with a flash or an explosion. This reaches its utmost extent in the affection those "three graces" of the metallic world, potassium, sodium and lithium, have for the polygamous oxygen, which combines with them to produce a race of salts.

Potassium is no ordinary individual to deal with in the elementary family, and is a powerful aggressor on oxygen, wherever found. It resembles a woman who having conceived a passion for a man, is led to disturb his married life, and is

the occasion of his wife's death by consumption. In like manner when a fragment of potassium is thrown on water, it dissolves the union between the oxygen and hydrogen, and combines itself with the former. In human society such a state of things occasions a great scandal; and the chemical change described, is likewise accompanied by "a flame" and "a report."

Barium is the most dense of the "Alkaline Earths," as well as the most poisonous; its salts in particular are corrosive and pernicious to animal life. They are truly heavy on the stomach, occasioning if taken in quantity great disorders, and death, the heaviest of calamities.

Strontium greatly resembles barium, but its salts have not the poisonous qualities of the preparations of the latter, that are soluble in water. Two corrosive substances when they meet, often form a salt comparatively inert, thus oxalic acid and lime in combination may be taken into the stomach without danger, while either taken singly in the same quantity, would cause death.

Sulphuric acid and baryta, present an illustration of the same rule. The sulphate of baryta is not poisonous, because insoluble in water. Good is proverbially "brought out of evil," and in human society it is often effected by bad *influences*, whose venom finds its antidote in another's fang.

The various salts of strontia give to flame a splendid red-colour; while the soluble salts of baryta communicate a brilliant yellow, and those of lithium a fine red of a different tint. Almost every other element, gives to colourless flame a peculiar tint, by which the elements can be traced in nearly infinitesimal quantities. "Spectrum-analysis," one of the most important processes in use, has led to these results. It is made with the aid of the prism, that Triad-Unity, whose antitype presides over the Universe, yet admits us into its secrets, and whose very cipher "the spectroscope," added to the chemist's tools, multiplies them tenfold.

Calcium is the basis of lime, of which it is an oxide. Lime is thus a compound, which in turn forms other compounds with various acids, and so the world is filled with its salts. Animals and plants cannot exist without it, if we except the very lowest of both kingdoms.

Lime is the alkaline earth of our bodies, being the stony-matter of our bones, that which gives to our solid-parts their hardness and substantiality. Lime is also the great cement in building those structures in the inorganic World under which we reside, and which assists in forming as it were the skeleton of our wants; for our frames like our houses depend on lime. The furniture and fittings of our dwellings call in the aid of a great variety of elements, before they can be fit for the habita-

tion of man, and in like manner his skeleton must be covered and furnished with much more than mere lime, phosphoric acid and gelatine, before it can be a fit temple for his Spirit.

Magnesium, calcium and strontium are metals which resemble silver in lustre ; but as they crumble to powder when water touches them, they have none of the enduring qualities of that material.

They are types of those individuals, whose virtue, notwithstanding their shining appearance, cannot bear the smallest test, or the most ordinary uses.

Magnesium is a weaker base than calcium and its oxide—lime, is much less caustic; but not having so powerful an affinity for the carbonic acid of the air, is avoided by the farmer. When he manures his soil he rejects lime contaminated with magnesia, which does not at once destroy the organic-substances which the farmer wishes to get rid of; but remains long a rotting-canker in the soil, affecting the weeds and crops alike. The sole cure for this is the application to the land of a strong mineral-acid, which dissolves, and renders soluble the caustic-alkali. These magnesium-limestones, are types of the bad farmer, who possesses but a moderate share of active-energy; yet who is “a bitter-opponent” of agricultural progress. The sour-tempered but vigorous Agent, can alone deal with him.

The alkaline-metals are of an inferior order and less specific gravity than the metals in common use. They are more lightly regarded than the “nobler metals,” in which density reaches its utmost extent.—“Gravity inspires respect.”

Aluminum is the most important ingredient of the true-earths, being the basis of clay, and with lime, silica and iron, the most common of the elements, solid at ordinary temperatures. The alkaline-metal aluminum, so fashionable for ornaments, is of a lustre between zinc and silver. It retains its colour much longer than those metals, but from its softness and other defects, is not nearly so applicable to the wants of life as silver.

Aluminum is one of the principal ingredients in *bricks* so much used in building ; which have been long held to represent good-natured fellows whose popularity is increased by being on a metallic basis. They are rough sons of clay at best and their wealth, is often difficult to extract from them ;—like aluminum from its earthy source.

Glucinum is the base of the beryl, the emerald and the aquamarine, which in general have little lustre unless cut and polished. The salts of glucina, the oxide of this metal, are soluble in water and have a sweet taste.

Glucina and its compounds, remind us of one whose associations have rendered him rather too refined and sickly in his tastes, but who possesses considerable vigour of character, which developed in after life, enable him when cut by adversity and polished by prosperity, to produce in literature or art, that which sparkles in a dazzling manner, and causes him to be pronounced "a Gem of the First Water."

Precious stones have always occupied a most important place among the valuables of a civilized nation, representing great worth in small bulk; and an enduring preciousness exceeding that of gold. They are eminently types of man and his life, which is of so priceless a character. Men have been in all ages compared with precious stones, which have different degrees of merit, purity and value. Thus diamonds have many degrees of "water" and lustre, as well as of size and shape. Other precious stones, have different measures for accurately indicating their price. They are types of nations as well as of individuals.

The operation of cutting silicious stones is a difficult and tedious one. In England it is performed by the aid of diamond-dust, with which the stones are roughly cut into the desired form, and are then ground down with emery, according to the hardness of the stone, on wheels of wood, copper or steel. The diamond can be cut and polished *only by itself*, and with Incredible labour.

It is typical of the Teutonic and British races, who are when uncultivated, "rough diamonds." They need a great deal of hard polishing; not by other and softer nations, for that would be ineffectual—*but by each other*. French, Germans, Swedes, Italians, Spaniards and Danes, possess many of the qualities of the "true diamond," but in very different degrees. The choice and cultivated inhabitants of Britain, "that gem set in the silver sea" are "of the first water," and sparkle like brilliants.

The lower classes are still "Diamonds," but are often rough and unsightly; and to the ignorant eye inferior to the polished populations of more Southern regions. In reality as inferior to them in value, as the cut glass is to the rough diamond.

The northern Nations of Europe, cut, tear or grind inferior peoples; like diamonds in contact with softer stones. They leave their marks indelibly engraved on the page of a nation's history, reduce a savage tribe to a civilized form, and like the "stone cut without hands," grind the intractable Nations to dust.

In proper hands a very small diamond will cut, grind and assist in reducing into form, a large stone. One Englishman of energy, may rule a whole province in India, whose population

has not in general that hardness, which can resist his concentrated power.

Diamonds are easily broken and crushed to powder with the aid of an iron-hammer. Those who are refractory among the diamond-nations of Western-Europe, will be "Ruled with a rod of Iron, and dashed to pieces like a potter's vessel." But their very dust will be the instrument in the hands of the great Jeweller, for cutting all softer stones, and polishing those of their own kind, to fit them for offices of ornament and beauty.

The sharp-edge of the diamond as naturally found, is alone fit for cutting glass, or other silicious-materials. A man to be a true ruler and commander amongst men, must be naturally keen and sharp. No amount of polishing can give him this ; it rather detracts from his native power.

The ruby, the sapphire and the emerald-corundum, rank next to the diamond in value among precious stones, and may typify great nations. The ruby may represent the nations of Arabia ; while the sapphire may those of Persia and the emerald the Brahmins of India—all valuable in a high degree, but still inferior to the nations precious as diamonds. The ruby is perhaps the rarest and scarcest, and the sapphire next ; but the emerald is almost equally precious.

The jacinth or ligure, is a hard stone not of great value, unless of extremely fine water and large size. Being of a copper-colour it may typify the Red-men of America.

The oriental yellow-topaz, typifies the Chinese, who have a saffron-complexion ; while the smoke-coloured varieties, may represent the swarthy-Calmucks, allied to that great race. Diamonds are a hundred times more valuable than topazes, although the latter are in far greater number. The Chinese are much more numerous than Europeans. These stones are far less precious than the diamond, the emerald and the ruby. The beryl, the carbuncle, the chalcedony, the onyx and the agate, belong to a still lower class.

The onyx represents a *hybrid*, the result of a union of black and white : while the sardonyx is an illustration of a union of red and white races. The beryl may represent the greenish-olive Nations of the Pacific. The chalcedony may typify light hybrids, nearly white, with a few streaks of colour of irregular quantity and quality, forming crosses of little value.

There are diamonds of almost every hue, but they are mostly very rare, and correspond with uncommon and wonderfully gifted specimens of inferior races. Thus there are black-diamonds almost as dark as jet, or Toussaint L'Ouvertures, and about as rare. There are yellow-diamonds, answering to genius

among the Chinese ; and there are pink-diamonds, as there are wonders amongst the Red-tribes.

All these coloured-diamonds, must be regarded as mere curiosities for the cabinet of the mineralogist ; just as these examples of men are but oddities and rarities in the note-book of the biographer. Their colour is regarded as quite out-of-keeping with a stone in which purity is the greatest merit ; and this purity is understood by men in general, to be but an indication of the valuable qualities recognized in the diamond type.

We prize coloured-diamonds perhaps more than ordinary diamonds of equal size, as we do these curiosities of Ethnology, as specimens of what a race can produce ; but who greatly deviate from its type. Being in fact in almost every instance as different from their parent race, in mental constitution, as the yellow varieties of the crystallized carbon, are from that topaz which they resemble only in colour.

CHAPTER XIV.

CHARACTERS OF MEN ILLUSTRATED BY CHEMICAL ELEMENTS.

IRON—STEEL—OXIDES OF IRON—MANGANESE—NICKEL—COBALT—ZINC—BRASS
 — CADMIUM — BISMUTH — URANIUM — COPPER — BELL-METAL — LEAD —
 CHROMIUM — TIN — ANTIMONY — ARSENIC — SILVER — GOLD — QUICKSILVER
 — PLATINUM — RHODIUM — PALLADIUM — IRIDIUM — OSMIUM — THE CHEM-
 ISTRY OF LIVING ORGANISMS — THE NINE CLASSES OF ORGANIC SUBSTANCES.

IRON being one of the hardest and most tenacious of metals, has long been accepted as typical of what is strong-willed, enduring, vigorous and sustained in the human constitution.

Iron is the principal colouring matter on the Globe, being much used by the Divine architect, and by those who endeavour to imitate Him in the colouring of bodies. The different combinations of iron are no less important in their uses. Steel is a compound of iron, carbon and various other substances which differ in proportion to its qualities; suited to so great a variety of purposes.

If iron is a type of firmness, carbon is of the combativeness which supports firmness in its determined course, "steeling" it against the action of other faculties. Steel is an even more enduring metal than iron, and being much harder, cuts through life better. Combativeness must be combined with firmness, in a hero of the great "battle of life."

Steel in the hands of skilful manufacturers of the age, becomes a "precious metal," rising higher than gold; although its original source iron, is the cheapest and commonest of metals. A pound of iron may be made into Fifty thousand pendulum watch-springs, and thus become One hundred thousand-times the worth of the raw material.

If steel is a type of firmness well supported by courage, these applications of steel, more precious than gold, are illustrations of resolution in what is good and right, which is so highly valuable.

Varieties of cast iron are "obstinate" when cold. Hammering may crush or crack, but cannot alter their forms. When over-

heated, they, like the obstinate pigs after which they are named, run with facility towards the trough or gutter.

Steel or iron is the metal used for balances, knives, weights, swords, cannons and guns. Typifying justice, division, decision, execution and the vengeful tongue of the destroyer.

There is a great difference between "cast" and "wrought-iron." The first is harder even than the second; but is easily cracked and broken by a concussion, which would not affect the other. Cast-iron is a granular substance, and wrought-iron is a bundle of fibres.

Men in whom the Bilious or fibrous temperament predominates, have often an "iron-will," and a complexion like the brown-oxide of iron. These persons have muscles of such strength and toughness, that we compare them with "wrought-iron." They are popularly called "wiry."

Iron is almost exclusively worked with tools of its own metal. Those of other metals make no impression on it. In like manner "iron-willed men," can alone control, or aid in reducing to subjection, those of similar character.

We are in one of the later-ages—"the Age of Iron;" but it has become as valuable as gold. The great abundance of metals in our days, has caused it to be the type of *every age*; for gold, silver, brass and iron have each a prominent place. The age of Stone is passing away, and that of METAL is more and more coming in.

The different salts of iron, are highly important in medicine and the arts. They exercise a stimulating effect on the blood; stirring it up to deeds of valour, by infusing some of the "iron-element" into the veins. The salts of iron are apt to exercise an astringent or drawing effect on the body, and to make the frame more compact and "wiry." But this course of iron must not be carelessly used with delicate constitutions, such has caused the death of many. The human-body like the machine, may be screwed tighter than the frame can bear, and so what formerly exercised a conservative influence, loses its binding power, and the complicated "machine" falls to pieces by its own weight.

Iron is unsuited for some purposes, because of its great affinity for the oxygen of the air, and the hydrogen of the water. The most delicate cutlery, or the roughest castings, are alike destroyed by these agents in a short time. Yet this rust,—so unlike pure iron, can be reduced by great heats, back to its original metallic-state.

Iron and carbon largely contribute to the greatness of England. These are combined in cast-iron and steel, for which she is so famous. The source of "cast-iron" is the clay ironstone. The feet of Nebuchadnezzar's image were made of "Iron and

Clay;"—"partly strong and partly broken;" which signified at once the *strength* and *weakness*, the Centralization and Division of the Roman Empire. The "clay-ironstone," illustrates Britannia as a Roman province. The "cast-iron" as the civilized British Empire; which has succeeded. It possesses the hardness of the iron with some of the friability of the clay. The "Iron and clay" which did not "cleave together," may also as suggested by Gervinus, typify the intermixture without union, of the Celtic and Teutonic Nations.

Steel though a compound metal, contains few of the earthy impurities which make cast-iron crumble to powder. Steel the emblem of what is Just, Right and Powerful on Earth, will last until the age of rust comes on. Iron and steel, unlike most other metals, generally last longest when used; for idleness is more destructive to them than rough treatment.

The men of iron are more injured by indolence, than by the hardest labour. The "Iron-age" cannot be destroyed by those of the other metals: its decline must proceed from the neglect of opportunities of usefulness.

Sulphur has a great affinity for iron, rendering it brittle, and destroying its useful and characteristic properties. It is here a type of "the Angel of Destruction," bent on surrounding "the iron age" with exhalations from volcanoes of evil passions. Iron when once corroded by sulphur, cannot return to its original purity, without passing through a roasting-process in "the furnace of fire."

The bisulphide of iron (iron-pyrites) contains a double equivalent of sulphur, and shines like gold, for which it has often been mistaken. It is a type of the "kingdom of the Evil one," which shines with a false lustre, but crumbles to dust on great concussion. Iron may be made to part with its sulphur and become pure again; yet it has always an affinity for this element. They must be kept apart or they mix.

The oxides of iron are various in colour and properties. There are human beings whose complexion and hair, show a resemblance to these substances: we may compare them with the different temperaments of men. The protoxide,—very dark brown when pure,—the most powerful as a base, is a type of a dark brown-haired, "wiry" person, whose hair owes its colour to an iron source. The sesquioxide of iron is of a red or brown colour, varying in shade, and answering to many red- and fair-haired tribes, who leave behind them like this oxide, an indelible iron-mould.

Iron-stains are difficult to get rid of, and so is red hair. A visitor to an Irish village asked why so many of the children had red hair. "The priest has red hair" was the prompt reply.

The Black or magnetic-oxide of iron, which is the lodestone, is a type of raven-black-haired individuals, so popular "in the matrimonial market;" which is probably one cause of the increase of black hair in our population. This hair has magnetic attractions like this oxide; and black eyes are Magnetic-poles which exercise some influence at a distance; but are often "irresistible" when brought into vicinity with eyes of another colour. And as in the law of magnetic-attraction "the force decreases inversely with the squares of the distance;" so does the power of those "animal-magnets" black eyes.

The influence of the lodestone is not always permanent; for it may readily be diverted from one variety of iron to another. And in like manner human magnetic-currents, vary "in points of polarization" with time and place.

Manganese is a metal allied to iron in many of its properties; but it has an even greater affinity for oxygen; and is so brittle as to be unavailable for making tools. It communicates this brittleness to other metals, and spoils them also for malleable purposes.

The salts of manganese, particularly the manganic and hypermanganic acids, and their salts of potassa, change colour so remarkably, that they have been named "chameleon minerals."

The changes and transformations which chemistry unfolds to us, are greater than are found in other departments of knowledge; for here form, colour, specific-gravity and properties, undergo great modifications. These varied transformations, are but types of extensive changes in Man's life. Chemistry is one of the pillars of physical science, one of the great props that support "the temple of knowledge."

The presence in iron, of manganese, silicon and phosphorus, even when in too small quantities to convert the whole of it into "a salt;" exercises on its malleable properties, a most pernicious influence. They act like the dog in the fable; who took possession of a manger of hay, and refused to allow the ox to approach and eat, although he could not himself feed there.

"Nickel," with which the slang term "Old Nick" is connected, is an ore from whence the metal nickel is extracted. These ores,—found by the German miners of the middle ages, in search of those of silver and copper, were at first mistaken for them. But yielding none of these metals, they were supposed to have been created for the disappointment of man, by the malicious "Spirits of the Earth." Hence they received a name similar to that bestowed on Satan.

These ores anciently thrown away as useless, are now in great request, for the manufacture of "German" or "Nickel-

silver,"—a compound of brass and this metal; far inferior to silver, and in many cases highly poisonous! The change in the estimation of nickel, is typical of that which has come over the public mind, with regard to the Being who was supposed to be connected with this mineral. In former ages he was dreaded, and his power for injury acknowledged. Now his existence as an evil agent is often overlooked; and his power is even invoked, for such useful purposes as "rapping" or "table-moving," by those who forget how soon he may "turn the tables" on them.

Information derived from such a source is not necessarily *truth*, although it may form a substitute for TRUTH; as this base metal may for the silver it somewhat resembles. The poisonous qualities of nickel, are greatly increased by the large amount of arsenic with which the impure metal is contaminated.

Cobalt is most familiar to us from the uses of its oxides and other salts in the arts. They have not beautiful colours; yet when dissolved in enamel or glass, they form the pigments, known as "cobalt" and "smalt." The oxides and phosphates, give to glass, splendid tints of blue and red, which may be made either transparent or opaque, according to the medium used. These are the chief applications of cobalt, which was associated with nickel, in the curses its ores drew from the mouths of the German miners.

Such brilliant and permanent colours obtained from "the Earth," are types of an unchangeable state when things will not transform as they do now. The fugitive, yet ever-blooming colours of Organic substances, are types of living progress, waving too and fro, but still progressing. Every spring supplies as exquisite flowers as the preceding, and as the world advances in age, those of richer and more mature tints, will burst upon the brightening scene.

Zinc is very brittle, being of a crystalline character. It is easily melted and cast; and at a temperature little above boiling water, may be hammered or drawn into sheets or wire; but when cold it is intractable. This metal has a great affinity for oxygen; and in fine shavings or turnings, will burn like wood, throwing out a bright-coloured flame. Zinc when exposed to "a good red-heat" in the air, smoulders into a yellowish white oxide—"the philosopher's wool." It may be volatilized at white-heat, and distilled like quicksilver and some few other metals. It is excellent for taking casts, and is used to form false bronzes which are afterwards lacquered over to imitate that metal.

Zinc suggests treachery, by exploding or smouldering away when we little expect it. The chloride of zinc—a virulent

poison, forms an excellent means of disinfecting, by destroying subtle animal- and vegetable-poisons; in accordance with the principle adduced in "Romeo and Juliet,"—"One fire burns out another's burning." This principle is often shown in the "Moral-world," by the manner in which an agency not good in itself, is the means of counterbalancing or destroying a worse.

But the great use of zinc is in the manufacture of brass; a metal intended to imitate gold. Yet "what a falling off is there;" a poisonous smell; a lustre that fades and turns green with damp air, or brown with smoke, or cankerous-green with vinegar;—and yet it at first shows a brilliant face.

Brass has long been accepted as a type of pretence with little reality; of Great sound of Trumpet with little music. It is a poisonous metal whose wounds leave a canker. Brass as a metal and "brass" in human character have their uses. They are vulgar it is true. But common metals and vulgar people, are wanted in a world, where every one is the better of being able to play on "his own trumpet."

Brass wears remarkably well, both in water and out; but requires frequent scouring by rough hands or it gets rusty and foul. In like manner our "brazen-faced" friends, require to be confronted by those who can oppose them with vigour; they become more "polished" and pleasant by the process.

Brass we have said is a compound of copper and zinc. Copper represented "Venus" among the ancients: and if zinc is a type of treachery, brass the union of these metals, may typify qualities in the character and conduct of "the libertine."

Cadmium is a metal resembling zinc, with which it assists in the art of photography, its iodides and bromides being more soluble in the alcohol and ether of the collodion, than the other "bromo-iodizers." The sulphuret of cadmium is one of our most brilliant yellow-pigments, and with cinnabar forms a fine scarlet. Cadmium possesses many of the properties of zinc, but is volatile at a much lower temperature, by attending to which it may easily be separated when the two metals are found together. It is much less easily acted on than zinc.

If zinc is a type of a treacherous character; cadmium by its greater volatility, is that of the "slippery person" who flies away when provoked.

Bismuth is very brittle, melts at a lower temperature than most metals, and is capable of assuming beautiful, crystalline forms. The subnitrate of bismuth, its most important salt, under the name of "pearl-white," is often used as a cosmetic by those who wish to appear fairer than Nature has made them. Its immediate effect is to produce a leprous-whiteness of the skin, which when exposed to foul-air or sulphurous London-

smoke, may assume a mulatto-hue ; an alteration caused by a change in the bismuth, from a white—"nitrate," to a black—"sulphide."

Those who hope by the use of unnatural means, to improve points of which they disapprove, find they are grievously wrong, and "only mar instead of mend." Under a course of bismuth, a skin "slightly tanned," becomes very "like leather."

Bismuth is the principal ingredient in the well-known fusible-alloy, which is used for taking casts of Organic-substances. Metals are eminently adapted for castings ; and those which require great heat to melt, may be said to be "powerfully cast." A type of a strong-minded man, who cannot be moulded without a great deal of "blast" and force. These alloys of bismuth, melt almost as soon as they are put into hot water, and take the impressions of whatever they are near. Like the weak-noodles who run into, and take any "fashionable form" they fall in with.

Uranium, a scarce metal, is principally obtained from the "pitch-blend of Saxony." It is chiefly valuable on account of its oxides, which give to glass and enamel, beautiful black, and pale yellow tints. An attempt has been made, to use the nitrate of the peroxide of uranium, as a substitute for the nitrate of silver in photography, but being less sensitive to light it is not so suitable ; proving it to be a less "noble metal." These part easily with their oxygen ; while the "ignoble" tenaciously retain it.

The "noble metals," from their purity and permanence, are emblems of incorruptibility and immortality, which hold so little to Earth, and feed so little on its atmosphere.

Copper—known to the ancients, is of a brilliant rich colour, unlike that of any other pure metal. When finely polished and free from oxide, it is a dazzling object. It is exceedingly malleable and ductile, and much softer than iron, but less apt to rust either in air or water. These properties render it a favourite on board-ship, for "Jack" abhors rust.

Copper is an unwholesome metal unless in a perfectly pure state. It is the principal ingredient in brass, bronze and bell-metal. Being extremely sonorous, it takes the first place, wherever "high-sounding" metals are wanted. Hardly any musical instrument is made without it. Bells are never hung without it, for the handle contains copper, as well as the *bell* and the *wire*.

Belles in society are most effectually set in motion by "wire-pulling," which is often connected with what is "brazen," and is an "underhand" process.

Copper in its native state is usually combined with sulphur

or arsenic, and in this connexion typifies a *death*; which so frequently succeeds a love affair.

Arseniate of copper and its combinations, although of fine, green tints which rival the most beauteous hues in the vegetable world, are pernicious when applied to the house or the toilet. For they corrode living plants or animals, and communicate to inanimate objects, the brilliancy, but poisonous properties of arsenic and copper. This poisonous bloom, this mockery of healthy green, forcibly illustrates vices, which wear an aspect of pleasantness to the eye.

Copper in its natural and artificial combinations, yields many shades of green, which form permanent pigments when ground. Thus there is the malachite—a carbonate of copper, containing water of crystallization. It is found in Siberia and Australia, and is much prized for ornamental purposes, but does not wear, like a silicious-mineral.

Copper is the principal ingredient in gun-metal, which divides with Iron "the service of war." In ancient as in modern times, —Mars to whom iron was sacred divided with Venus the presidency of battles. "The smiles of the fair," being often as necessary to good fighting, as good swords.

"Store of ladies whose bright eyes,
Rain influence and judge the prize."

And "Venus" has sometimes as much to do as "Mars" with the occasion of conflicts.

The preparations of lead, the heaviest of the common metals, are mostly sweet but poisonous; yet they do not directly take effect on the body. Lead was anciently sacred to Saturn. The influence of Satan is sometimes like that of a slow poison; for a long time scarcely perceptible from its stealthy movements; yet not the less capable of injuring Man.

The oxides of lead are of the highest importance in the arts. Litharge—the protoxide, enters into the composition of glass, and the glaze of earthenware. It is a means of purifying oils for varnish, and forms with them an insoluble soap-plaster, called "diachylum." This is useful for protecting sores from the action of the air, and forms as it were "a glaze" for their conservation, like that on earthenware. This coat of varnish, composed of poisonous materials, protects delicate objects against the attacks of still greater and more virulent poisons.

Red-lead is much used to preserve wood from decay. Its action resembles that of mineral-poisons generally, which kill, but arrest decomposition to a great extent. When men are once dead, as regards their Immortal portions, changes are retarded; for the variations of organic life, cease.

Lead-pipes convey the water that we drink, that purifies and revives us. Were this fluid pure, it would soon corrode the lead and become poisonous. Most water is impure, and contains sulphates, which form an insoluble coating on the surface of the metal pipes, which protects them from the further action of the water.

This is highly significant as a Moral-illustration of the impure channels through which we derive our Truth. They would soon be utterly corrupted, but for counteracting influences, not perhaps in themselves good ; but antagonistic. The combination of two virulent poisons, often produces what is "neutral" and harmless. TWO BAD MEN MAY DO GOOD IN OPPOSITION TO EACH OTHER.

Chromium was so named on account of the brilliant colours of its compounds. It forms with silver, lead, mercury and potassa, salts of bright red or yellow tints. They are exceedingly corrosive and consequently destructive to organic-compounds, which they force to combine with oxygen, with such violence, as to occasion explosion or decomposition:—such salts are highly poisonous. Chromic-acid contains an excessive amount of oxygen, but holds it very lightly, yielding it with but little pressure, at the first demand of most bodies. This reminds us of those whose sense of right is but "loose," and who let it "slip" with slight temptation ; a weakness which leads to their own destruction.

"Tin when bent, utters a grating sound," from the friction of the crystals of which it is composed. It has a great affinity for iron, to which it readily adheres when in a melted state. This coated-iron is the "tin" or tinned-iron of commerce. It rusts less easily than iron, copper or lead ; hence it is a cleaner metal to handle. The peroxide of tin forms enamel, when dissolved in melted glass. The bisulphuret or "mosaic-gold" is a common counterfeit of that precious metal, while its protochloride, yields with the perchloride of gold,—the "purple of Cassius ;" a fine tint, when applied to melted-glass.

Tin was dedicated to Jupiter ; and in preserving other metals from rust, it plays a part similar to that which was assigned to him in keeping order among "the gods." Yet tin itself liable to rust, is illustrative of the impurities of "the Father of the Gods."

Tin as assisting in the formation of the principal mineral-purple, is an important type of rule and authority ; but true gold is necessary to produce the brilliant-result ; the sham "Mosaic-Gold" will not do.

Antimony is one of the principal ingredients in the metal of which the printing-types are made.

If antimony is the great remover of obstructions in the human body, these metallic-types, are the great agents for removing those obstacles, which hinder the progress of knowledge.

We have already shown antimony to be one of the most "combative" of metals. Its chloride is used to prevent rust in gun-barrels. Its sulphurets, form with nitre and charcoal the blue signal-light, which sets itself in opposition to night, by illuminating a great chasm of darkness; and with chlorate of potassa, form a detonating-mixture, more powerful than gun-powder.

Arsenic has already so bad a reputation, that it seems almost superfluous, to say anything that would put it in a worse light. It forms with hydrogen, one of the most poisonous of gases, which cannot be inhaled without occasioning death.

Arseniated hydrogen, whose vapour utterly destroys organic life, is a type of a chief minister of Beelzebub whom the metal arsenic itself illustrates. Arsenious acid—an oxide of this metal, is the preparation in most common use, and has a sweet taste and form, like sugar. This deadly poison in the guise of a wholesome substance, may typify "Satan transformed into an Angel of Light."

Arsenic will combine directly or indirectly with most metals and elements: but the combinations are usually poisonous. The influence of Satan is most general and destructive.

Sulphur and arsenic combined, yield the red and yellow salts used in the manufacture of green and other coloured fires in pyrotechny; but their fumes are of a pestilential character. Arsenic imparts its brittle character to other metals. It is a means of rendering lead, more inclined to take a globular-form, and so it plays an important part in shot-manufacture. It increases the destructive power of lead, in making it more fit for killing animals. The circular-form to which arsenic contributes, rolls with greater facility, the tide of death and destruction round the globe.

Arsenic, the most powerful arrestor of decomposition in animal-tissues, is the poison most frequently used in destroying their life. Its analysis and detection, present types of the means of tracing the presence and machinations of the "Evil-One."

Arseniated Hydrogen, may be easily reduced by heat to its original metallic-state, so as to form a shining, black mirror, which disappears entirely when a stronger heat is applied. The analyst in this case, reminds us of the "magician" looking on his mirror, until it is lost in smoke. This dark and volatile arsenic, has just the colour and properties of the fabled being, "with Horns and Hoofs."

Silver preserves its purity and delicacy in air, in water, and in the hottest furnace. It only becomes purer as it is heated and refined in the cupel; any rust that is there, is reduced back to the primitive metal. Its affinity for oxygen, being so much less than that of most inferior metals, they retain or absorb it at the melting-point of silver, which affords a ready means of separating these different elements. This is referred to in Mal. iii. 2, where our Lord is compared to "a refiner and purifier of silver" watching the process.

The surface of the melted metal in the cupel, is at first red or orange, with an undulating variation of colour. As the air is blown on the surface it becomes lighter, brighter and more silvery by degrees, until the melted metal appears like a looking-glass in which the image of the refiner can be seen. The process is sometimes a long one, and is done through the agency of lead, which as the air is blown on it when mixed with the silver melting in the crucible, is either oxidized and blown away, or absorbed in the crucible.*

This throws much light on the pains which our Lord will take to "purify the sons of Levi," who will probably undergo the sorest afflictions, until at last as in the pure and bright mirror of the melting-pot, the reflection of the image of the master refiner is seen.

Silver cannot be volatilized, neither can its oxides be produced by heat. It has a lustre like the moon, and is one of the most ductile and malleable of metals; yielding only to gold and platinum in these respects, and exceeding all others in beauty and brilliancy. As the emblem of the moon, it is a type of the Church, the light of "a benighted-world;" while gold, the emblem of the sun, typifies "the Sun of Righteousness." When He rises, then will be the second "Golden-Age."

Silver is oxidized by acids alone, and nitric acid is the best medium for this purpose. The "lunar-caustic" or nitrate of oxide of silver, is a compound of this salt and nitric acid; but it feebly retains the acid. The presence of any baser-metal, such as iron or copper in the soluble solution of its salts, causes it to return to its pure metallic state, and to forsake the acid with which it had formed an alliance.

This nitrate of silver is a type of "the church" corrupted, which parts with its impurities in the "age of iron and brass," and returns to a pure state.

The custom of plating base-metals with silver, to give them its lustre and superficial-appearance, has been common in different ages of the world. The various improvements in the art of counterfeiting silver, well illustrate the growth of hypoc-

* Compare Napier's Metallurgy of the Bible, p. 24.

ris. The ancient plated objects of the Greeks and Romans, typify the hypocrites of apostolic times, who on a foundation of what was impure and base, affected the external habits of the saint.

The old plating processes were superseded by the mercurial : a more efficacious counterfeit, but thrown into disuse by the even more perfect "electro-plate." By its aid, a coating of silver of any desired thickness, may be placed on the basest-metal, so as to give it an appearance of perfect purity. Electro-plate is warranted by the advertisers of the age, to be "for every purpose equal to silver." These complete forgeries, are types of modern Arch-hypocrites in the Church, who are so entirely covered with what is pure, that they appear to be most holy.

The coating of silver on electro-plate, in time wears off, and the base-metal underneath is perceived. The hypocrite's "cloak" at last becomes tattered, and his *true* character is seen. Plated-articles are of little value for the melting-pot. Hypocrites cannot stand the fire of persecution.

The galvanic current, "the presiding spirit" of electro-metallurgy, is a type of the unseen agency so much tampered with in the present day.

Nitrate of silver is one of the most important chemicals of the age. Its old uses as a cautery and tonic, are small, compared with its value in the modern art of photography.

Gold and silver, the emblems of the sun and moon, may be said to preside over this Art; the sun is the means of taking pictures, and the moon, whose rays have so little actinic power, is the type of that light by which the artist sees his work during the process.

Nitrate of silver most easily parts with its oxygen and acid, to any organic substance under the influence of light; hence its value in photography. The rays which affect the salts of silver and other metals, constitute but a part of the solar spectrum. This explains the photographic art, which would be impossible but for this limitation. Did all light, affect photographic chemicals equally, the process would be complete ere it could be seen.

Iodide and chloride of silver, being more sensitive to light than the nitrate, and parting with iodine and chlorine through the influence of light alone, without the necessary intervention of any organic substances, are at once pointed out as the photographer's most precious servants. The action of light on these substances, reduces them to their metallic and semi-oxidized state, which is effected in a gradual and delicate manner, by the use of collodion in the glass, and albumen, gelatine or other foreign substances in the paper processes.

Unfortunately for the beautiful art of photography, these sun-pictures, like some sunny and bright scenes of our imagination, are fugitive. But "the brightest do not fade the fleetest."

The present state of the albumen process in photography, may illustrate the fugitive beauties of earth. The carbon process which has every prospect of permanency, may typify unfading-beauty. Like the carboniferous-rocks, it will carry down to remote ages the *vivid* representations of a living-past.

Chloride of silver is like pure white-curd when first formed, but is completely decomposed by the action of light, and becomes black and uncomely. Like our deeds that retain their delicacy only in the dark, when "a veil is thrown over them."

The celebrated "fulminating-silver of Berthollet," a compound of oxide of silver and ammonia, is one of the most explosive of substances, for when dry the touch of a feather is sufficient, to produce a violent detonation. The noise of it sounds very loudly, like "the report" of any disorder in the Church. The oxide of silver represents the Church somewhat corrupted, but in an inert state. The ammonia typifies what is actively impure and contagious. The union of the two, foment mischief, and a mere trifle is sufficient to occasion a great commotion.

Gold shines out at once with a precious lustre, unapproachable by other metals. It is more generally distributed than any other metal, except iron and the bases of the alkalis and earths. Gold is unaffected by hot or cold oxygen-acids, which dissolve silver and other inferior metals. Its great specific-gravity, brilliant-lustre, and scarcity in quantity, have caused it to be more ardently sought after than other metals, and to be the type of whatever is precious or desirable among the time-honoured treasures of earth. Were it not so widely known it could not have become a standard of value in so many countries.

It has been coined ever since the days of Darius; at a period not much later than that in which the most early silver coins of Ægina and other Greek cities first issued from their rude dies. Since that period it has been considered an indication of wealth and advanced civilization, for a nation to possess a Gold-currency. Then is truly the "golden age" of a nation's commerce. Then its chronicles are written in Letters of Gold. But these are dazzling, and may make our eyes blind to the light and shade of history; though it fill the brightest pages "of the book of time."

A silver-currency though inferior to a gold-currency, may yet exist in an advanced state of civilization. But the bulk of silver in proportion to its value, is so great, that it becomes

manifestly unfit to play the part of gold, when man has attained his highest condition. But the iron, the least polished of all, is the age of what is rough, harsh and hard. Such was the time of Lycurgus and his iron-coins. But the iron-coinage of Japan, accompanied as it is with that of silver, bell-metal and gold, is a type of a state of society which has varied qualities. Wealth and power are illustrated by gold and silver; self-confidence by brass; and hard-energy by iron.

Gold—one of the softest but at the same time the most malleable and ductile of metallic bodies, can be drawn into wire nearly as fine as the thread of the garden-spider, which may be woven into gold-gossamer, to catch the literal flies. A web of gold, spun by “the spiders of the Stock Exchange,” entangles and ruins many Men of moderate means.

The softness of pure-gold, renders it unfit for those purposes where it would be much exposed to abrasion; and so from early-times it has been thought advisable to alloy it with copper or silver; by the help of which, it is made more fit for common use. But pure-gold, to the cultivated eye, possesses a far more beautiful shade than any of its alloys, and passes through the fire without loss of this colour.

Common-characters are fit for common-purposes, and perform the ordinary duties of life; perhaps better in the world's-estimation, than pure, exalted-characters. They have a Good share of golden-honesty to be admired, yet this is somewhat alloyed with tricks of trade, or professional sleight of hand, esteemed by them necessary to success in life. Man with his varied-character, may be compared with the different parts or “carats” by which the fineness of gold is estimated. Alloyed-gold may thus be typical of human nature; for there is no man who does not possess some good quality, however much he may be corrupted. The “gold” in him, may be purified from “the dross,” and he may be cast anew in “the Image of his Maker.”

Pure gold is represented by twenty-four carats, which we believe to illustrate perfect honesty and integrity. Most nations know what pure gold is, and they prefer it when given to themselves; but they do not so commonly give it to others, for it is quite the exception to meet with it in commerce.

Many of the German-States, issue base metal, which they pass off as silver;—a type of their governments, their public-faith and their national-conscience. The currency of Austria is particularly debased; the silver being very impure; but the Austrians are not so badly treated by their rulers as some of the petty States of Germany, whose silver is half-copper, if not altogether free from lead. The French-standard is not so high as the British and they deduct from “their currency” the value

of the coinage-process, while the British, issue their gold at the value of the metal. We do not adopt a currency of *pure-gold*, for such would be unsuited to the tricks of a commercial-nation ; but still our standard is higher than that of most nations, and is of gold,—not silver.

Silver has been "the standard" in India for a long period. It was so till lately in France and over most countries on the continent of Europe. If nations were to adhere "to their standard," so much injury would not be done to society, but the frequent variations in it in some countries, derange commerce. Let nations by all means abide by their agreements, for a breach of covenant is the most flagrant moral obliquity.

The alloy of gold with silver and copper is significant. Copper or brass harden gold, yet would injure its colour, but the addition of silver renders it much more white and like pure gold. The copper and brass, represent boldness and assurance which would be too offensive if not toned down by what is purer. Pure gold by retaining its lustre and impressions longer than any of its alloys, may represent the highest order of virtue, which is appreciated at last. It is only the "gold" in man that can stand the test of time, the "dross" is forgotten.

Gold is an article in universal request ; it is beat out into thin-leaves, which ornament the commonest objects in use ;—so, few persons can now say, "silver and gold I have none." Its brilliancy goes far to hide what is dusky, or to enliven the dullness of sombre objects. It shines from the gloomy bookcase, from the picture-frame or the salt-spoon ; like the sun in a dark-corner, which it gilds with its sprightly refreshing beams, that dance to the music of light.

The astute-moralist cannot condone impurity under a brilliant-exterior. Sin when overlaid with gold is only *gilded* ;—"a cloke to hide" what is black and sombre and cannot bear the light. Many Guilds, but for their golden-cups would perish in gloomy-obscurity.

A single pound of gold, can gild silver-wire to encompass the globe, and the typical *pound of gold*, the British sovereign, goes everywhere ; buying what is to be bought, into "The fold of Civilization." The Chinese as yet, chiefly care for our silver, gold being too far beyond their standard of brass : for all coins of other metals used in the "Celestial Empire" are of foreign mints, which the Chinaman is in general, willing to receive in return for his brass, but prefers those of silver. Foreign merchants accommodate themselves to these celestial tastes, and assist to drain Europe of the precious-metals.

Quicksilver was sacred to Mercury, the most volatile of the gods ; and quick as a messenger of destruction it is among the

"gods" of the sick chamber ; coursing through the veins with "winged-feet," and reducing to a state of salivation ;—often called "salvation."

Mercury is fluid at ordinary-temperatures, and has a high specific-gravity ;—hence its value in thermometers, barometers, or as a counterpoise. Quicksilver is poisonous to organic-substances, which rebel against its use almost as much as against antimony, the emblem of opposition.

Mercury retains its lustre in water and in air, hence it has been considered "noble." From its fluidity and subtlety, it is the circulating-medium among the metals. It has great affinity for copper, lead, tin, gold and silver, rendering them capable of being applied to plating or gilding, which is one of the most extensive uses of the metal. As it permeates copper or gold ; it renders them brittle or rotten, notwithstanding their tenacity. It has an equally pernicious effect on the human constitution, and no part of the body is safe from its malign-influence.

Mercury combines with most acids and elements ; forming salts, which when soluble are highly-poisonous. Particularly the bichloride of mercury, which under the name of "corrosive-sublimate," sublimes when the sulphate of mercury is heated with the common salt of the kitchen, and by its power of arresting decomposition, stops at the same time the progress of life and decay. Sulphur and mercury have a great affinity, and their union results in two compounds ; the yellow protosulphuret and the persulphuret, which is either black or red. It is in the red-state the cinnabar or vermilion of commerce, which being insoluble, may be handled or applied to the skin, with a much less injurious effect than other preparations of quicksilver. It is already saturated with as much of the poisonous sulphur as it can contain, and is therefore comparatively inert. It is like the snake which has swallowed its prey, and whose ferocity and poison sleep ; or like the giant who is drunk, and whose nerves are paralyzed with a venom, even more violent than his own.

Another important use of quicksilver, through which it finds its way into every civilized-house, is in the preparation of the amalgam of tin, which lines the backs of mirrors. They display our faces as well as those of our friends, and assist at important optical illusions ; for when artfully placed, they lengthen apparent distances. When not perfectly even, they give to the features a twist or inclination towards one side ; a type of our commonly incorrect view of objects in the "mirror" of life : this is true of all ages past and present.

We look down upon a clear-brook ; a dancing-image displays itself to our view with twice the motion and apparent life of the original. This living looking-glass, presents more sprightly-

images than inanimate-glasses do. It is the analogue of the mind, reflected through the medium of life, as the mirror is, of that of past-days : for it is a still-medium ;—a glass that reflects our shadow as a corpse. The reflecting-brook, may be compared with the journals of the present day, as the still-mirror may with the chronicles of the past. We have said that the “living-water” presents a more lively-image ; but the inanimate-looking glass it must be confessed exhibits a more truthful representation. In like manner, the records of past days, often give us a more correct idea of the character of men ; and why ? —Because the rapid current of Human-life, disturbs the equanimity of the mediums that criticise its features.

Amalgamation in which mercury plays a part, is a process of great importance in the separation of Gold and Silver from the common metals or dross, with which they are mixed. The ores are ground to a fine-powder and digested with the liquid mercury, which combines with the silver and gold they contain ; but not with the iron or silicious particles. These float on the surface of the dense amalgam, which is then transferred to an iron-retort, and at a red-heat the quicksilver is volatilized, and the gold, silver and other metals remain.

This amalgamation process is an important type. The ore represents the present state of society, the crushing process the convulsions which are the first steps towards the dissolution of the present fabric. The quicksilver represents evil influences, which are used for the concentration of what is *precious*, diffused throughout an immensity of dross. The dross falls from the “amalgam” as chaff from wheat, which is thus ready for the furnace. The heat liberates the quicksilver, as does trial the evil. The trial is the means of purifying what has in it the rudiments of goodness and purity. The gold and silver are when purified, but little in bulk, compared with the original ore, yet in real-value they outweigh it all.

Calomel is the preparation of mercury most used in medicine. Its name is derived from two Greek words (*καλός, μέλας*) signifying beautiful and black ; in allusion to the manner in which it is prepared. Those who take much mercury, may be rendered “black,” if not “beautiful.” Various shades may hover round their skins ; the colours of the different salts of mercury. First pale like calomel ; then black like the oxide ; and livid grey as quicksilver when dead.

Platinum is as incorruptible as gold, but less brilliant and precious. It is coined into money in Siberia, where it passes current ; and is the medium in which the most subtle and corrosive agents of the chemist, are analyzed and prepared. The heat of the most powerful blast-furnaces does not melt it ;

for it passes unchanged, through acids that affect most metals ; and its expansion and contraction, influence the index of the pyrometer ; by which great degrees of heat are measured. It is heavier than gold, but in its power of being welded at a moderate red-heat, it bears some resemblance to iron. As it does not exceed bright-lead in beauty, it is not so well adapted as gold for ornamental purposes. It has a tendency to combine with the ignoble metals, tin, lead or zinc, which therefore cannot touch it when they are melted, without causing it to melt and combine with them. When pure it is fusible only with the aid of a galvanic battery, or at the oxyhydrogen blowpipe.

Platinum parts with chlorine—its principal solvent, with great ease. Thus if its chloride and that of ammonium, be dried at a red-heat, both the ammonium and the chlorine fly off ; leaving the metal pure ; but in so minute a state of division, as to resemble a sponge, like which it acts on air and gases. If held in a stream of hydrogen in air, it becomes red-hot, and inflames the gas, its porosity causing chemical-combination between it and the oxygen of the air, with such violence as to produce this great heat.

The platinum is unchanged itself, but is the agent for effecting an important change. This reminds us of the position of some individuals in society, who do much, without great apparent wear of their constitutions ; who alter others permanently, without any apparent change in themselves. The various retorts, dishes and crucibles of platinum, perform an office similar to this, being the medium of great chemical-changes, but being themselves generally unaffected.

Platinum is the centre of a system of elements, which cluster about it as the moons do round Jupiter. These metals are palladium, rhodium, iridium and osmium. Palladium resembles platinum in colour, but is less noble, as all the satellites are than their great sun. Palladium is oxidizable by heat alone, while in a spongy state ; and can also be dissolved by nitric-acid. It resembles platinum, in forming double-chlorides with potassium and ammonium. An alloy of copper and palladium, can be applied to useful purposes. If the copper predominates, we might think it resembled brass, and could not be "a true palladium."

Rhodium, although associated with platinum, is a great contrast to it, in being brittle like antimony and bismuth. When added in a small proportion, it is said to increase the hardness, and improve the qualities of steel, for such purposes as making drills. In the combination of its chlorides with sodium and ammonium, it shows analogy to platinum and palladium. It is not affected by any acids, except when in a state of alloy ;

but experiments are not often made with it, as it is one of the scarcest of metals.

It is strange that substances, existing apparently in such small quantities as these allies of platinum, should be dug out of the sand of the rivers of Brazil or the Ural ; should come to civilized Europe ; pass through the ordeals of the crucible or evaporating dish ; be separated and analyzed with such consummate skill, that they may be presented pure, before the spectacles of profound-philosophers. This searching process, by which no insignificant element can remain hid, reminds us of that long and tedious investigation, by which the different points of evidence, are separated and analyzed in a criminal court, when the case is considered of importance. The accused perhaps are sent home for trial from a distant land ; their appearance excites interest, and different processes are set at work to extract the merits of the cause.

The counsel for the prosecution, fall upon the accused, analyzing the case ; separating its elements, and reducing it to soluble proportions ; as the crude platinum is by hydrochloric acid. The prisoner's hopes of acquittal during this ordeal, are very small. Soon different parties are found to be mixed up with the accused, whose existence was not previously known to the general public. A great deal of backward and forward process, with much heat on both sides and cross-examination is gone through, before the "five pirates from Brazil," can be clearly identified, and condemned to solitary confinement ;—as these poor elements implicated in the trial of platinum, are to a lonely existence in bottles.

Iridium is the densest substance known, after gold and platinum. Its salts are many-coloured ; hence its name, which calls up rainbow-tints before our minds. It is almost infusible and insoluble in acids.

Osmium is so called, from the offensive odour of its oxide—osmic acid.

The elements that have been lately tried, are platinum the chief, condemned to be used up into crucibles, retorts or other dishes, to be passed through the fire to the Moloch of modern chemists ; to be treated worse than if put "under harrows or axes of iron ;" or "to be made to pass through the brick-kiln." Palladium is condemned to a lot not much above poor platinum. It is beat out into gum-plates, instead of gold, by which old ladies are victimized. Iridium with all its many-coloured salts, and rhodium with its shortness of "temper," are condemned to a dull life as curiosities ; unless needed to point gold-pens. And osmium, although allowed to take an occasional share in this process, is like the Negro, rejected by refined

society, for the ill odour which accompanies so many of its preparations.

The chemistry of living Organisms, varies greatly from that of the Inorganic-World, for chemical-agents act very differently on living- and dead-organisms. "The Human stomach," said Sir Astley Cooper, "is not a Wedgewood-mortar." The effect of heat is very diverse on living and on dead subjects. The dead are roasted by a temperature, which the living could support for a considerable time.

Organic-chemistry does not throw much light on vitality, by its direct analysis ; but its consideration is necessary, as involving the requirements of life. Inorganic-chemistry *includes all*. It is the chemistry of the elements, whose combinations are and were created for the supply of the exigencies of life. This great-division represents typically, the primitive constituents of our Immortal-parts, which are represented after death and dismemberment in the very essence of our being. Organic-chemistry is much more limited in its representation of man's system. It is mainly typical of those parts of his frame that are less under the influence of his will, such as the involuntary-muscles.

This subdivision of man's-system, is not to be taken in that full and absolute sense, which would exclude him as a unity ; but it shows analogy with the division between Organic and Inorganic-chemistry. The second includes the *first*, but the first only contains a portion of the contents of the second. Yet these few elements, by their various and complex combinations, form bodies so diverse and varied in their properties, that we might almost fancy that they contained the whole elementary series.

The so-called Organic-elements are representative of Man's Corporeal-organs, which they feed during life ; but our object is to show that what we discover by Organic analysis, is but a very small part of the truth intended to be conveyed. A truth which forms but a link of literality, the typical link being connected therewith.

We shall endeavour to show the connexion between Organic-chemistry and the corporeal-organs of Man. In organic-chemistry, we see frequent imitations of substances in the inorganic-world. Thus cyanogen and melon, although compound-bodies, yet behave like elements, and the alkaloids of vegetable-origin, resemble in many of their properties, the oxides of the metalloids and earths. But these Organic-bodies are much weaker in their elementary and basic-action.

In like-manner the mental faculties and their combinations

that typify the Inorganic-elements, are more powerful and ruling than the mere organs of involuntary-motion, that illustrate the organic-compounds. These exercise an all-powerful influence in their sphere, yet can do less externally, than those organs which from their very nature are of a less material character.

Some classification being necessary in the consideration of such a subject as this, let us consider the Nine sections into which these organic-substances may be divided. The *First* consists of the Salt-radicals,*—and true radicals they often are in their action on other organic-substances; reducing them with the lightening torch of a destroyer to the earth out of which they were formed. The *Second*, consists of the Organic-salt-bases, consituted by the Vegetable-alkalis, while their suitable partners form the *Third*-class or Vegetable-Acids. The *Fourth*-class consists of such substances as Gum and Sugar, which contain the elements in the proportion that compose and form water, but without any nitrogen. The *Fifth*, substances such as albumen, gelatine and fibrine, uncrystallizable, but contained alike in the Animal and Vegetable divisions. The *Sixth*, the carburet of hydrogen and *its oxides*. The *Seventh*, those fatty-substances,—the oils and grease of animals and plants. The *Eighth*, those acids which are formed by the combination of mineral-acids, with such an organic-compound as alcohol; the sulphovinic-acid being the representation of the class. Lastly and *Ninthly*, those substances which are either colouring-principles, or cannot be arranged in any other way.

The elementary-constitution of these bodies, affords little assistance in this arrangement, if we except the nitrogenized-substances; and so we are led to look for types for them; not in the analogy between their elementary constitution and that of mind; but in that between the properties and qualities of each.

Organic-chemistry is especially the chemistry of growth, development and decay, and illustrates that of the more corporeal parts of man; while inorganic-chemistry and its more stable compounds, remind us of those faculties that never die, but which acting through perishable mediums, cease for a while their visible action. But when at liberty to form affinities in accordance with their constitution, they will draw from the soil, elements suited to a new and higher life.

These Organic-substances are mostly unstable in their composition, their very existence depends upon decay. But certain circumstances, suspend this change for a short period. There can be *no life* without decay, as the "Organic-Empire"

* Professor Fownes' division is followed here. See his Manual, 1845.

is at present constituted. But after death it may be arrested ; analogous to the state of quiescence without progress, in which Man is, after separation from his corporeal-system. *The more we live, the more we die.* The more vigorously a man moves on the face of the Earth ; the more "Worlds he conquers ;" be they Material, Intellectual or Moral, and gives evidence of active life ; the more rapidly does he cast off the clothing of his spirit, to be renewed as long as vigorous life is given to him. "Vigorous life" is rapid decay, but rapid renewal. Disease and fermentation are somewhat allied, they are both states in which bodies receive assistance from without, from what is in a state of change ; which brings about changes for the reception of which they were without doubt adapted, yet needed an external impetus.

Organic-analysis is of two kinds, that which reduces to the primitive Inorganic-elements, and that which reduces to the combinations of those elements which are comparatively stable, and which convey definite-ideas ; yet those differing from what the mere proportion of the primitive-elementary contents would indicate.

These Organic-elements are in the first place the constituents of the organic-substances, and in the next they form combinations which in some cases act like elements. The source and progress of life is at present inscrutable ; but we can feel, that about which we cannot reason. The mind of man being the type of his body, we use its analysis to illustrate what we cannot individually dissect. In the Mental-faculties, which are analyzed by Phrenology, we see *thirty-seven Primitive-elements*, and a few semi-faculties, produced by the union of two or more. These act like elementary-faculties, in the same manner that the Salt-Radicals, do amongst the chemical-elements. Yet like the Salt-Radicals, they are capable of division into primitive-elements, if the analysis is carried deeper.

Let us continue the illustration of mind by matter. In Organic-chemistry we have alkaloids, allied in some of their properties, but not in their constitution, to the alkalies of the Mineral-Kingdom. These resemble those combinations of faculties in mind, which serve to supply comparative deficiencies in special primary qualities.

The organic-acids are very powerful in their affinities, reminding us of those combinations of faculties which produce great effects with little means, through advantageous circumstances. The bodies of the Gum, Starch and Sugar class, destitute of nitrogen, remind us of those combinations which without progressing, serve to maintain life for some little time ; such being the effect of these substances on the human-body. How dif-

ferent is their effect from that of the nitrogenized-class, to which muscles, fibre and sinews belong; without the aid of which the animal-frame cannot grow.

The carburets of hydrogen, are illustrative of the great sources of light to man. The Fats and Oils form the chief fuel which protects his tissues, and are types of that on which his mind glows. The union of a neutral-body with a mineral-acid, results in the formation of the Sulphovinic-class, which illustrates the action of the propensities on particular parts of the body. The colouring principles so generally diffused in the Organic-world, give to it appropriate hues, but are themselves separable into a *Ninth* and last class.

CHAPTER XV.

POPULAR ILLUSTRATIONS DERIVED FROM ORGANIC CHEMISTRY.

SUGAR — STARCH — OXALIC ACID — FERMENTATION AND ITS PRODUCTS — OILS AND FATS — GLYCERINE — WAX — BENZINE — PRUSSIC ACID — CITRIC ACID — TANNIC ACID — ORGANIC BASES — ORGANIC COLOURING MATTERS — ANILINE DYES — VOLATILE OILS — PERFUMES — OIL OF MUSTARD — RESIN — DRAGON'S BLOOD — CAOUTCHOUC — TARS — CHEMICAL AND MENTAL ANALYSIS CONTRASTED.

MOST men and animals are lovers of Sugar, of which there are many varieties. Cane-sugar, produced alike from cane, beet-root and maple, is the richest in flavour, and is what we commonly meet with as a culinary agent. Sugar is the sweetener of our acid fluids, and the mask of those that are bitter and nauseous. It is an emblem of the pleasant-savour, which palliates many otherwise sore and sickening trials.

There are many other varieties of this substance; grape-sugar is one of the most abundant, and is found in most fruits that have a sweet taste. Fruits are much sought after; and the *sweet* are commonly preferred.

What is sharp and acid in the events of life is not agreeable, but like the sour-fruit, it may stimulate our appetites, and assist us morally to digest many a tough trouble. Sugar combines with various bases, such as lime, baryta and oxide of lead, forming poisonous substances, which have a sweetish-taste, sufficiently significant of the character of many compounds of good and evil.

Starch is the great stiffener of fabrics which have little rigidity, the representative of unyielding bulk, as contrasted with elastic fibre. Starch is allied in its composition to the sugar of the Animal Kingdom, and performs a similar office in the nutrition of animals; that of a supporter of respiration, by supplying carbon to the blood. Gum is another substance performing similar offices. The cellulose-lignine-matter, or vegetable-fibre, of which cotton and linen fabrics are composed, is a non-nitrogenized substance, also allied to starch.

Oxalic acid is an important constituent in many sour leaves

and plants in which it occurs, as an acid-salt of potassa. Cane-sugar is the sweetest substance known; and may be taken as the pleasantest in this sense. But the action of nitric acid on it, converts it into this salt, one of the most powerful and corrosive of acids.

This reminds us of a pleasant person with a high, fine tone of mind, who in the power of a cruel tyrant, loses his reason and becomes a vicious and malign character. This strong acid is found in a few shrubs, in an impure state and in small quantities. A type of those persons usually "sour," but who do not like these plants attain that intense sourness, which characterizes those who have been amiable.

Fermentation is the accompaniment of the metamorphosis of the yeast-plant, or other allied organisms, which contribute to important changes in bodies. Pure sugar is the enemy to fermentation, and may be taken as a type of what is Good and Holy. But if any substances containing nitrogen, are present in the proper state of decay, in a solution of sugar, a change takes place, if the temperature is maintained from 70° to 80° Fah. Carbonic acid will then be disengaged with effervescence; the liquid will become transparent, and will contain alcohol.

This change from sugar to alcohol, is eminently suggestive of the fall of man, from his "Sweet state in Paradise," through the introduction of a corrupting influence. Man was formerly pure, and perfect beings could look on him with complacency; but after his fall, only Demons could behold him with pleasure. DRUNK WITH HIS FERMENTED BLOOD, THEY GLOATED OVER HIS RUIN.

This alcohol is not the final stage of fermentation; neither does it typify the Last state of Man. It may be purified and strengthened, but is still the product of "decomposition." Alcohol may be made from a great variety of animal or vegetable substances; almost wherever sugar and a nitrogenized Organic compound in solution can be got together. The earliest fermented liquor was probably wine, derived from grape-juice. This when partly fermented, still retains a portion of its sweetness; and is in this state illustrative of the corrupted condition of our race, who are however not in a hopeless state. Like wine, man may be rendered sweeter, or may pass into a last stage, like that of vinegar;—a type of a hopeless condition.

Wine is the national drink, in such Southern countries as Syria, the south of France and Spain. It is a thinner and more transparent fluid than beer. Those nations who drink it, are not so disposed to corpulency as the beer-drinking inhabitants of the North, and are less inclined to use powerful stimulants, which their weaker constitutions cannot endure. But the

natives of Northern Europe, supplement their beer and fiery spirits, with the strongest wines of southern regions; and earn for themselves the prestige of being "the greatest Drinkers," and "the greatest Drunkards in the world."

Beer is made from grain, which has by soaking in water, undergone the first stage in growth or germination. Such is accompanied by a change to sugar, in a part of the starch it contains. When this growth has gone sufficiently far, it is stopped by drying at a high heat, which is followed by crushing and infusion in water at 180° Fah. After which the mixture, on standing three or more hours is strained; the clear liquid or "wort" being boiled with hops, that communicate a flavour. The liquid is then cooled, transferred to large fermenting vats and yeast is added. The fermentation is partly stopped and it is put into casks; but a slow fermentation follows there.

This beer is a type of corrupted man, who as soon as he begins to *grow* must change and decay. The saturation of the grain with water, is a type of the first stage in corruption after growth. The boiling represents the violent excitements, which draw the substance out of the Man, and prepare him for the reception of external vices.

Lactic acid is the acid of *Sauer-kraut*. Sour milk has to most persons a very unpleasant taste. The "Milk of Human Kindness" turned sour is very disagreeable; it is worse even than the most "sour" natural temper; it begets canker in the Mind.

Alcohol, the active principle of most intoxicating liquors, is the result of the distillation of any fermented infusion in which it is contained. It is a clear, transparent liquid, and is justly called "a spirit," and is by many called an "evil one." It may be acted on by acids, and a substance formed termed ether, which is more volatile than most liquids. Its clear vapour was thought to resemble the fluid or medium, supposed by Sir I. Newton to occupy the space between the atmospheres of the stars. If such "ether" does exist, our home-manufactured ether may be a type of it; as contrasted with the vapour of alcohol, which may represent the atmosphere of the Earth.—We have here "the Spirit and power of the Air."

It is very convenient to acknowledge the existence of a substance like ether, for such a fluid would afford solution for many difficulties, and form bridges over many obstacles. This is what the ether of commerce does, dissolving many alkaloids, many tough gums or slippery oils, and removing them from the pores of what cannot be otherwise "cleared up," even to "microscopic eyes." The number of compounds of ether with acids, and those produced by the action of acids and alkalis or alcohol, are almost endless.

The most important is acetic acid, a product of the oxidation of alcohol. This is vinegar, which is made by carrying fermentation to a final stage with the aid of yeast, or by the destructive distillation of wood. In this way pyroligneous acid is obtained, this contains tar in solution. The action of vinegar on the Human System is that of a slow poison, causing it to shrivel. But its effect on dead substances, is that of an *arrestor* of decay ; hence the keeping-properties of smoked meats, which absorb it from wood-smoke. Vinegar when much used is apt to promote "decline," suitably emblematic of the *latter* stage of one, who has been given over by the Good, and will soon be under the charge of Evil Spirits.

The world has long been full of spirits, of which one of the most famous is the well known "wood-spirit," to be obtained by the distillation of wood, and which may be a type of the Mythology of the Grove. It combines with alkalis, which again found a race of compounds as the "gods" of Greece and Rome did, with the nymphs of the fountains and the fields.

The most celebrated of this offspring, is that famous "deity" of modern pharmacy chloroform, which is obtained by the action of hypochloride of lime on "wood-spirit." By distillation a liquid is obtained, which produces a powerful effect on living bodies, reducing them to a state of coma nearly resembling death. But this is merely temporary ; only to last till a tooth is out or a child born ; at least so it is intended when a "*Post mortem*" is not desired.

Fusel-oil is a very curious liquid, intensely suffocating in its odour. It accompanies the distillation of alcohol, to which it gives a burning, unpleasant taste, strong smell, and unwholesome properties. This substance in alcohol is like the green colour, sometimes added to arsenic to distinguish it from sugar, by housekeepers who do not wish to confuse their poison and their food. Some persons will not have poison separated, from what best indicates its true character.

Oils and fats being highly carbonized bodies, contribute much to supply fuel to the animal and vegetable kingdoms. They are closely allied in both divisions, and eventually in their nourishment of higher animals, perform similar parts. They are divided into two important classes, the Volatile and Fixed-Oils. Namely, those that can be distilled without decomposition, and those which refuse to evaporate, even when exposed to the air for a long period. The "fixed-oils" are subdivided into the *drying* and *non-drying* ; that is, those which become resinous by absorption of oxygen ; and those that may become rancid, but never evaporate.

Oils are types of the great "Movers" among men. They are our purgatives, they lubricate our machinery, and promote the more rapid motion of every part. They assist Man's movements; although not the Machinery itself, yet they are the Fuel which supports it. However strong the muscles of a man may be, without a covering of fat he cannot continuously accomplish great things. Some men are of a round shape, and like barrels of oil are thickest in the middle. They greatly abound in fat, and whether found in the pulpit, brew-house, custom-house or public-house, are generally solid and fixed in their dealings. They are like the fixed-oils, "not volatile," and force must be used to remove them from their posts. They are coarse in their gestures, and like these substances, often leave "a stain" on all they touch.

The Fixed-oils contain two or three substances; stearine, margarin and olein. The two first being very solid, are not easily melted; they are highly important however in the manufacture of soap and candles. Olein being fluid at ordinary temperatures, is exceedingly useful for lubricating machinery. These three bodies by their relative properties, illustrate the varied solidity of the "oily" class of individuals, to whom we have just referred.

The olein that gives to oils their fluidity, their smoothness and power of lubrication, exist in varying quantities in different fixed-oils, which we consider typical of the qualities possessed by fat men of diverse nations. Olive oil is the kind of fat most eaten in many parts of the South of Europe, and is thinner and more unctuous, than the "drippings" so much used in the North. But all yield in hardness to the suets of British formation, which are more solid, and more resemble pure stearine, than those which any other country produces.

The prototypes of British suet, are a stout and sensual class of Englishmen, whose very soul is obscured by fat. Such often die from the excessive accumulation of fat in their internal organs, greatly induced by over-indulgence of appetite. Fat individuals both of human and brute lineage, are the most juicy and fleshy, if their fat is not carried to too great an extent. But it is better to see them too thin than overfed; for whenever fat gets beyond control it becomes a great curse.

The olive oil typifies the thinner Italian and French, as the suet does the more stout British farmer. The Italians and French are more vegetarian in their mode of living, and are more refined and pleasant at table.

The more perfect oils, such as the neat's-foot, found in the feet of cattle, and the oil of seals and whales, do not readily separate from the solid constituents they contain. They are a

type of the more refined members of the classes, dependent for their living on agriculture and fishing.

The fixed-oils unite with oxygen, to form margaric, stearic and oleic acids. These combine with "bases," and form compounds of greater or less importance, of which the principal, are the soaps used for removing grease and other impurities. But they do more than cleanse; the free alkali contained in them, partly dissolves the organic substances they touch. Soap is fat rendered soluble, and applicable to the purposes of a detergent.

The "stout" men to whom we refer, have commonly a great deal of physical power, which only requires to be under control, to take a form of great utility. Our stout friend may be useful single, but is a more general "benefit" when married. He thus becomes subdued, which greatly improves him, like the saponified fat.

The drying-oils such as that of linseed, are intermediate in properties between those that are most "fixed," such as olive oil; and those that are "volatile" like the essential oils.

Linseed oil is the principal ingredient in the "polish," by which wood is rendered beautiful and elegant. This art is of foreign extraction, like those processes which commonly give lustre to many of our best materials. But it is now carried to greater perfection in England, than even in the country where it was first adopted. We execute minute details, more thoroughly than most nations. Hence our code of etiquette is strict;—our finishing of many goods not to be excelled;—our "finished gentlemen;"—the FIRST in Europe.

Glycerine is the base of fats, and combines with mineral and vegetable acids, to form artificial fats, not dissimilar to those from which it was originally taken. Glycerine has a sweet flavour, and is a neutral body, having little action on animal and vegetable colours. It does not readily decompose, and is therefore much in request for the preservation of objects from decay. The fats from which it is obtained, are the great shields which protect animal tissues, from the corrosive action of the air.

The sweet glycerine is a type of that good-nature, which is at the bottom of the characters of "our fat friends."

Glycerine when decomposed by the powerful Nitro-Sulphuric acids, forms the highly explosive nitro-glycerine, which is so sensitive, that the least touch from any "hard or sharp body" may cause a "blow up."

Wax is a highly important substance, somewhat allied to fats and like them consisting of several distinct principles, which with alkalis form soaps. The most abundant ingredient in wax

is cerin. Wax burns better than the fatty-acids, and is tougher, more tenacious and sticky. Its agglutinating properties are turned to account, by those who wish to give firmness and solidity, to fibres of a loose character. Typical of the assistance and friendly *twist*, our weak, loose friends, get by external pressure. They then acquire a nerve and power they had not before. Some individuals have little ability to resist force; unless under the influence of some strong stimulus or passion; which as it were "screws up their courage," to a point foreign to their nature.

Benzine or benzole is condensed bicarburet of hydrogen; such as is obtained by the destructive distillation of coal. It is poisonous, and yields a variety of compounds, some of which are deadly, but others like benzoic acid, may be taken by man in considerable quantities with impunity. This beautiful, white salt, may be volatilized and condensed, so as to rise in vapour, and fall like a shower of snow. When gum benzoin,—its principal source is heated, benzoic acid escapes from the earthy-ingredients with which it is mixed. It ascends to Heaven as it were, to be purified, that it may descend pure to Earth. Gum benzoin as the probable "*onycha*" of Scripture, played an important part in the incense of early Israelitish worship.

The hydruret of benzoyl, or essential oil of bitter almonds, is frequently mixed with prussic acid; which is not necessary to its flavouring properties, and may be easily removed by the protochloride of iron. Prussic acid when concentrated, is a most deadly substance in its effects on organic life; causing large animals to fall dead, on swallowing but a few drops.

Prussic acid is a type of those evil agents that obstruct ventilation; that adulterate food; that dig cesspools; that turn "rivers of life clear as crystal," into drains of muddy filth, that poison and destroy those living near them, or in them.

Iron is the great remedy or antidote for prussic acid as for arsenic; but the acid is so rapid in its effects on the human body, that it is often too late to apply any remedy. Iron is the great dividing agent; the great ROD which will hereafter rule evil influences and render them harmless. This acid with potash and iron, forms "Prussian-blue," which according to some chemists gives the blue colour to steel; which is believed also to give many of its valuable properties to the deadly cyanogen. The blue tint of heaven when brought down to steel, is illustrative of the operation of severe and constant rule, through instruments of the hardest metal.

The vegetable-acids so abundant in the fruits, stalks and roots of plants, mostly if not all, contain water as part of their constitution. The principal of this class of sub-

stances is tartaric acid, which gives the sour taste to grapes, tamarinds, and pine-apples. This substance is exclusively obtained in commerce, from that tartar which is precipitated on the fermentation of grape-juice. This crude-tartar, contains tartrate of lime, as well as bitartrate of potassa. The "cream of tartar" is its most common preparation. This crude-tartar has some resemblance to the "tartar" of our teeth. They are both rich in calcareous matter; and are found abundantly in all countries, especially in wine-growing districts, including Tartary. The inhabitants of that country are both sharp and sour, like the substance; hence we say, "Catch a Tartar."

Citric is the acid of lemons, and the salt that gives to the smallest fruits of the lemon-family, that acid juice, which the bark and leaves of the parent tree do not possess. This acid is "essentially" the salt of lemons.

Malic is the acid of apples and pears, giving to them a great part of their pleasant flavour. Its solution easily decomposes, and forms a resting-place for mould. When apples or pears are cut, they in a few minutes become brownish, and the juice stains calico with the same tint. They are among the choicest of earth's fruits, and retain their flavour longer than most others, if the integrity of their rind is preserved.

They are a type of favoured races, long enjoying prosperity; but whose fall is only the more complete when their borders are successfully invaded.

Tannic acid, imparts a high degree of bitterness to tea, oak-bark and galls. It is of great importance to society, being necessary to the tanning process by which the skins of animals lose their stiff, rigid gelatine, and become leather, flexible and little apt to decompose. Tanning is a long and tedious process, which would be trying to anything but leather.

It reminds us of the course of training man undergoes, by which all that is stiff and rigid in his composition is precipitated. He is then fit for a useful life; being flexible yet tough; yielding,—yet wearing well. A skin like leather, with muscles like leather, are generally found on persons of this character of life and mind. They are not much affected by difficulties or disappointments. They are not torn or rendered useless by them, but are commonly unpolished. Of late years leather has been enamelled, which is known by the name of "the patent." This however will not stretch like the old leather, although it is more glossy and finished in appearance. Dust does not adhere to it as to common leather, but still it is apt to split and lose its lustre by a little abrasion.

Common leather is a type of the rough countryman, who can be turned to so many purposes, and who is but little inclined

to become "cracked," but may do so more readily if he becomes "more polished." The rough untanned hide soon decays, as the man does when placed without previous training in trying circumstances.

The organic-bases, are those substances which comport themselves like alkalis or bases, without containing a portion of alkali from the Mineral Kingdom. Some few are of animal, but the greater part are of vegetable origin. They are the representatives of the more powerful qualities of their sources: hence in the Botanical Firm they should be called "The active principles." They have a less strong basic-action than their analogues in the mineral division; but this comparative weakness, is compensated for, by the immensely powerful action they have on the animal economy. They are mostly acrid and bitter; and are but sparingly soluble in water. Alcohol and ether form their best solvents; sufficiently significant of the way, in which a person may be intoxicated and poisoned at the same time.

The most important of these Active-principles, are the cinchonine and quinine, to which the Peruvian-barks, those most valuable medicinal agents, owe their febrifuge qualities.

These substances are types of trials, whose action is healthy, not cankerous; which enlarge the desires; tend to stir the veins, and to infuse into the man, a spirit of vigour and healthy action. The effect of quinine as a stimulant and astringent, is in some cases too violent. It exercises too conservative an influence on the system, stopping "free trade;" "closing the ports;" and reducing the whole frame to a "State of Blockade."

Morphine is one of the most important alkaloids derived from opium. Its various salts are commonly used as narcotics for causing unnatural sleep to deaden pain; or to produce unconsciousness when operations are proceeded with. The malefactor avails himself of the properties of this substance, when he desires to render his victim unconscious of a robbery. The effect in a moderate dose is merely temporary. The happy unconsciousness of passing events, lasts but a short time. The mind awakes to misery, or physical depression, greater than before the dose was taken. Repetition only increases the gloom, when its immediate influence is over.

The effect of narcotics is stimulant or sedative, in proportion to the dose and other attendant circumstances:—A type of artificial life;—life opposed to the Natural laws which God has appointed. It is sought to stimulate at wrong times; which must involve an abnormal period of rest, from this unnatural excitement.

A great number of alkaloids exist in the tissues of plants; some of which possess more poisonous properties than are to be

found elsewhere. From being unstable in their constitution, they cannot be detected in the tissues of those animals killed by them, with the same facility as the less subtle, but more dense and simple mineral poisons. These Inorganic compounds, are more powerful chemically as regards "basic" or corrosive action; but they do not produce the same thrilling effect on living organisms. They do not like these Organic compounds course through the veins, and reduce a living man to a carcase, in an electric manner. The mineral poisons, effect as it were the disintegration of his frame, which falls to pieces as surely as it is undermined. But the organic poisons, stop the very centre of life, with a sudden suffocating grasp, like that of a giant's ghost. They pass away, and leave in some cases nothing but their effects.

If the influence of the inorganic poisons is a type of physical degeneracy and corruption; so the action of the organic poisons, roughly speaking, is an illustration of Moral and Intellectual pollution. This cannot be so easily traced, owing to its insinuating character; but is seen in its effects even to the most superficial eye.

Aconitine derived from the *Aconitum napellus*, is a glassy, crystalline substance, a fraction of a grain of which when swallowed, will reduce a strong man to the grave. Atropine from Belladonna, is almost as virulent in its effects; as is also strychnine from *Nux vomica*. The conine from hemlock, and the nicotine from tobacco, are oily bases, which with acids form crystalline salts, that are not behind any substances known, in actively poisonous properties.

The Organic-bases are far more numerous than the inorganic. If the Inorganic-bases, roughly represent those binary-qualities, which we see in the mental constitution of man; so do the Organic-bases, represent by their more complex character, and still more varied properties, the compound and dubious constitution of his Motives and Actions. Some are comparatively harmless, while others are hurtful; and all are productive of more or less important results.

Tens of thousands of bodies are formed artificially, and many others occur in nature. When we consider the amount of compound bodies known, and of those that are every year discovered; we find a number, probably sufficient to illustrate every variety of human compound quality, as forcibly as the *chemical* elements, illustrate the primitive qualities of the mind. It is probable that substances exist, and are known; or will be discovered, answering to the character of every individual that has ever lived, or ever will live hereafter. Substances as Individuals, are not identical, though similar in properties, and we

class them as Races, Metals, Solids, Fluids, Irritable, Stable or the reverse, and Acid or Alkaline.

The Organic-colouring matters or principles; the natural and artificial dyes, which give to most tissues their tints; are generally believed to be illustrative, of that "colouring" or "change of complexion," which the minds of men give to the subjects they treat of.—We shall endeavour to show this relation in some detail.

One of the most important of organic-colouring matters is indigo, a blue substance, formed during the fermentation of certain tropical plants. But it may be considered as a not unfrequent accompaniment of organic decomposition. Indigo is very permanent as a dye for textile fabrics; and may be volatilized and crystallized. There was for a long period a prejudice against its use; for it was called "one of the devil's dyes." But now it has taken the place of "woad" among the Britons, and serves to stain the blue clothes which the butchers, the representatives of ourso-called "cannibal ancestors," still wear, as the livery of, and best contrast to a sanguinary occupation.

It is difficult to destroy the colour of indigo, except by very powerful chemical agents, some of which only suspend its colour, changing it for the time to white or "reduced indigo." It is then easier of application to fabrics than in its original state, and when exposed to the air, it absorbs oxygen, returns to its blue colour, and clings with obstinate tenacity to Organic substances. Secondary means in chemistry often effect ends, quite insurmountable by direct combination. When substances are in what is called "a nascent state;" that is when they are *first* separated from their old combinations; they often unite, with what they had previously no affinity.

They resemble those persons, long under the control of strict governing principles, which have kept them from forming improper connexions. But when the restraints are removed, they contract alliances that have been hitherto considered monstrous.

Another important blue colouring-matter is litmus, produced during the fermentation of lichens; as also archil and cudbear; which are of little permanency, compared with the aniline dyes of purer hue. Litmus is so sensitive to the action of acids, that it is the principal test for them. Paper dipped in its solution, turns from blue to *red*, in contact with the weakest soluble acids; and again from red to *blue* on the addition of alkalis.

This sensitiveness is typical of the degree of constancy, practised by the rulers of Great Britain. The violet colour of litmus is typical of Empire. We have said that acids turn this substance red, and alkalis cause it to return to its blue state.

These transformations are illustrative of those of governments, who change from "true blues" to "reds;" and from *police* to Military, in time of riot; to return to Police again when the disturbance is over. But permanent rule is not liable "to change its complexion." It will not be "the sport of parties," but will be little changed by the utmost efforts of their venom;—like the aniline hues, by the acids and alkalis of the chemist.

Cochineal (*Coccus cacti*) is a little insect feeding on the leaves of the large Indian figs. The bodies of these insects when dry, yield to water and alcohol, a brilliant carmine colour, which is the precipitate when alumina is added.

This carmine is a favourite colour, with miniature and flower painters, who wish to represent nature. And with those "faded flowers" among the Human species, who desire to imitate the bloom of "budding life." This is the principal ingredient in "*rouge*." The *noir* follows when the "*rouge*" is off; therefore this is "*a losing game*" as regards the successful counterfeit of beauty. Carmine like the hue of most flowers, fades when exposed to the air and light, as do those, who resort to abnormal means of beautifying the complexion. These live too artificially to possess what God intended,—a "Bloom of spring" in Youth, and a Frost-bitten bloom in Autumn.

Aniline and its various combinations, have in this age, produced hues and tints, far surpassing any formerly applicable to textile-fabrics. Aniline is made by heating phenyl-alcohol: or from nitro-benzole by the action of other substances. It consists greatly of carbon; but contains hydrogen and nitrogen. Yet these brilliant tints, are the products of the action on it of oxidizing-agents. Substances rich in carbon are more permanent in their constitution than other bodies; pure carbon being the most stable of all the non-metallic elements, and only exceeded in this respect by the nobler-metals.

The diamond is the hardest and most brilliant of precious stones. It consists of pure carbon; but it is carbon in its most pleasing and agreeable form. The element shines here, and attains its utmost loftiness of position; none is so much prized as it is in this state. The "diamond type," as well as the largest productions in printer's ink, owe their permanence to CARBON.

Many of the preparations of aniline, are exceedingly permanent, and yield but little to the brightest sunlight. Colours that cannot stand the light are not entitled to the first place. The fashionable colour *mauve* and its various shades, is obtained by a complicated process from the sulphate of aniline. It gives to wool and silk, tints unequalled for purity and brilliancy, in ancient or modern times.

Most shades of purple, derived from other sources are un-

stable as dyes ; but this is one of the most enduring of colours. The Purple of Tyre,—dull compared with this hue, was scantily distributed, and was scarcely as permanent. It was but the blood of a whelk, and has passed away from general use, in preparation for a brighter hue. But our modern purple is a manufactured article ; one of the most refined products of the present advanced state of chemical art.

The appearance of these aniline dyes at this Age of the World is significant ; as casting pure and magnificent hues in which to robe "Old Father Time," in the days of his age and infirmity, they being bright in proportion as his flesh is withered. But his yellow and corpse-like skin is only dimly hid by the gaudy tints. Yet these brilliant hues typify more than that brightness which some try to cast around decay ; they shine from out a black dull and pestiferous medium such as coal-tar. THEY SHADOW THE RISE OF AN IRIDESCENT PHOENIX FROM THE FIRE. The diamond sparkles and illuminates, and the soot dulls and deadens what is near ; and yet they are both the same substance, but have passed into different forms.

The purple-mauve is an emblem of a pure and permanent rule ; and like the rose-aniline or magenta, which in the form of an acetate or chloride, gives to wool the tints of venous and arterial-blood, is a suitable type of the slaughter, that will accompany the advent of Universal Empire.

The pure yellow or chrysaniline, and the aniline-blue, illustrate the glorious and constant characters of this rule ; these colours being purer and more enduring, than the delicate shades in former use.

The Volatile-oils when pure are colourless, but easily take tints from those substances, with which they come in contact. They do not form soaps with alkalis ; and possess a pungent taste and powerful odour. They are the principal perfumers of the age and are mostly vegetable. They are greasy to the touch, but the stain evaporates either spontaneously or on the application of slight heat.

If the Fixed-oils are the types of our "stout friends," who refuse to move even when their seat is made *hot* ;* the Volatile are of the more sensitive and delicate "of the family," some of whom by their rapid motions, pungency of spirit and penetration may influence "a large circle." But the essential oils in general, typify a class of persons, far "too volatile" to accomplish much of a useful kind. They are great friends to the perfumer and give scent to the ladies or "flowers" of society ; but they do not, like "the stout men" give the right arm to progress.

* In chemical works the student is advised to drop any Fixed-oil on paper, and apply heat *below*, thereby to prove that it will not evaporate even when well warmed.

The essential oils are in great variety, but the most abundant is the oil of turpentine the product of the fir-tree. The balsams that exude from trees, are solutions of resin and volatile oil. The oil evaporates, and leaves the resin, a hard sticky substance ; or by absorbing oxygen itself, it is converted entirely into resin. Turpentine is a bitter substance, highly explosive and very difficult to extinguish when once inflamed.

It is a type of a comparatively "volatile" person, but one who is apt to "stick to what he touches." The dry fellow diffuses around him an atmosphere of drought and dullness ; but on the contrary the "volatile" man, attracts to himself what is lively, to cheer himself and others. Such a man is also somewhat like turpentine in being of a "detonating" temper. The Spaniards say, "*Muger negra trementina en ella*,"—"A black woman has turpentine in her ;"—that is to say she has part of the pungent, spirited, "volatile" qualities, which turpentine has. This does not refer to a Negress ; but merely to a black-haired and dark-complexioned woman of European descent ; who is apt to be more "spirited" and "fiery," than one with flaxen hair.

Turpentine and most Volatile-oils, dissolve resin and Fixed-oils with facility. An application suggestive of one of the chief uses of our "volatile friends," in assisting to rid us of "our fixed oily ones," when they become troublesome.

The oils of lemon-peel, orange-peel, juniper and pepper are important as flavourers. They serve as useful condiments, as perfumes to render rank, Fixed-oils, palatable for the table, or agreeable for the toilet. They are like the lackeys, the serving men and cooks, that "dance attendance" on "our fat friends."

These essential-oils enumerated, contain no oxygen unless hydrated, and are not our choicest perfumes ; for it is a necessary ingredient to a good perfume. A very large number of volatile-oils, contain two or three substances, in which they show analogy to the fixed-oils. The oil of anise-seed, an example of the series which contains oxygen, consists of a solid and a fluid oil, as does oil of thyme, rue and cedar-wood.

Camphor resembles the solid portion of a volatile oil, and is a remarkable substance ; for when oxygenized by that powerful agent nitric acid, it yields an acid like many organic substances. It is a strong, conservative agent, and like all such is powerful as a destroyer. Its fumes are fatal to animal life if much inhaled ; and it produces violent convulsions if taken in a large dose.

It is greatly used for guarding furs and wool, against the attacks of moths and beetles.

Camphor is the Oriental slave, who has charge of our ward-

robe ; but who may, if not kept in his place,—“take us off by poison.” He may like this substance be thought harmless, and allowed to rub our teeth when we are ignorant of the possibility of his putting a poison into our system, that may at least promote its decay.

The oils of peppermint, orange-flowers, lavender, rosemary and otto of rose, are amongst the choicest of perfuming agents. Odours are eminently typical. They are minute particles of dust or volatile substances, wafted by currents of air. They are of various kinds, for most bodies have a distinctive scent when pure, perceptible to ordinary noses. But every known substance has doubtless an odour which would distinguish it from others, were our senses sufficiently acute and uncontaminated.

Agreeable perfumes rising in wreaths and borne on breezes to the open doors of the nose, refreshing and inspiring ; remind us of good, profitable and healthy emotions and desires ;—Perfume to the Soul. But the balance must be maintained in the action of our faculties, as in the mixing of perfume-oils, or the result is less agreeable. Many that in a pure and undiluted state, are in the highest degree nauseous ; are when diluted, or modified by other ingredients, the most delightful we can enjoy.

A good combination in perfume, is a type of well-ordered Mental emotions. Contrast these with bad scents and their analogues, foul and filthy actions.

The fragrant oils and essences, represent Moral virtues, or what is charming and pleasant in life. The lavender that stands for Modesty ; can be endured, and is even agreeable in a large dose. Rosemary may represent Prudery, which is well in its place, but should not be used singly, when wedded to “old time ;”—a common combination in an atmosphere of pruders. The principal perfumes in “a wash to keep the hair from turning grey ;” are oil of rosemary and old oil of thyme. But these should have an addition of the oil of orange-flowers, or the scent is not commonly popular.

The orange-flowers which ornament the bride, diffuse around her, the sweet fragrance of a bright entrance on a new position. While the otto of rose, so agreeable by itself, is a type of that pure love, which forms “rose-sprays” through every passage of life. The rose so generally acceptable, is so in all stages ; and has always been the poet’s friend.

The essential oils containing sulphur, produce on us a less pleasant impression than the perfume oils ; yet are useful flavouring agents. The oil of black mustard contains sulphur, but no health-inspiring oxygen. Mustard-seed is only hot and

purgent when wet, for the oil which occasions this flavour is formed by the action of water.

All sulphurous substances remind us of evil agencies. King James I. proposed if he ever entertained "his Satanic majesty," to set before him "a dish of mustard with a pipe of tobacco as digester."* This was appropriate when we consider that mustard owes its flavour to a sulphurous oil.

Mustard by its pungency, and the heat it excites in our mouths, or on our skin, reminds us of the satirical Reviewer, who is a useful flavourer of a dulcet age; and who serves to infuse spice into what is insipid in literature. Too much sharpness in a composition, irritates the Mind, as too much mustard in a plaster, vesicates the skin; and occasions a sore that does not easily heal. A sufficient quantity of satire promotes "a glow," which relieves the cold, chilly feeling, caught by reading a dull composition.

The oils of garlic, assafoetida, and onions, are rank, nauseous substances, except in minute doses. Assafoetida is in Britain exclusively used as a medicinal agent, but in some districts in the East, it is said to be a substitute for garlic in flavouring.

The anti-magnetic property, attributed to the juice of onions, is perhaps owing to the sulphur contained in the oil, corroding the steel of the magnet. These oils dissolve sulphur and phosphorus, and are types of sharp, cutting agents, which display much heat, vigour and pungency.

The oil of garlic is a type of the sharp provincial editor, who displays so strong a flavour of "Kitchen literature." Scents of this kind once acquired, are not easily lost; they haunt a writer as long as he lives, and are only harmonious with the low, rank odours of Society.

Resin consists of two or three acids, which form with alkalis, soaps analogous to those of fat oils. The most valuable of resins is the lac; an important ingredient in sealing-wax and varnishes. It is affected by few acids, but dissolves in volatile oils, alcohols and ethers. Lac is brought from Malacca and other regions of the Indian Archipelago. It is an ingredient in the foreign varnish, so extensively given to articles of home production, to give them an air of what is exotic or costly. Thus filthy rags are purified and made up into paper; and paper into tea-trays, which are coated with lac-varnish, to imitate the productions of Japan; and articles of metal are lacquered over to prevent oxidization, and give them a gloss and a glitter not their own.

The different hard resins, such as copal, mastich and sandarac, when dissolved in spirit, form varnishes of greater or less

* *Vide* "Counterblast of Tobacco."

value, which with their applications, come from different parts of the world.

The old-fashioned method of rubbing furniture with linseed oil, may be called English, or at any rate characteristic of northern nations. It is hard rubbing; typical of the hard work formerly required in finishing ornamental articles. But now "science and art, have made great strides;" especially that connecting link between them, "technology;" by which the sublimities of the laboratory, are applied to daily life.

In the process of varnishing, or coating with gums derived from the Orient and South, we see the attempt to diffuse around our furniture, the glow and gleam of sunny lands. A coat of varnish fills up those pores in wood, which would otherwise afford lodgment for "the dust of ages," and enable them better to defy "the march of time," and to carry down the lustre of the past into the present.

Dragon's-blood has a very suspicious name among the resins. It is a common stain amongst furniture-makers, to give to light-coloured woods the hue of mahogany. The name and properties of this substance, are significant of fraud. A great imposture will be practised, on those stained with the blood of The great Dragon.

The process of staining and painting woods, is also highly characteristic of an age, in which "adultery" and "adulteration" are practised to a great extent; particularly the last, which is a thoroughly English vice. This is much fostered by "John Bull;" who though generally beyond other countries in honesty; yet Here, prefers "to say one thing and do another." He must have his wood *stained*, his plaster gilt, and hues foreign to substances imparted, if he would please himself. A characteristic which goes further in the Moral world. Man calls things by their wrong names, gives to what is base and vicious, the lustre, the varnish and the gilding of virtue.

Caoutchouc or Indian rubber, is a very permanent compound, consisting of two pure Hydro-carbons united. Gases are the only perfectly elastic bodies, and these solid Hydro-carbons, resemble "condensed gases," and doubtless owe their elasticity to this cause. It is a most wonderful substance, and its applications are almost endless. So very few chemicals affect it, that it may be used for conveying them *unchanged*. It repels water, and its thinnest film, will exclude either this liquid or air.

This is a type of something surely very wrong; and so completely out of order, as neither "to bear ventilation" nor water. If gases are the emblems of Spiritual agencies, these solid gases are of their application as lever powers, amongst those solid living bodies, whose presence is evident to our senses.

The remains of extinct organisms, are a great source of the carbon available for man's use. To these we must add the vast quantities supplied by bodies recently decomposed. Carbon has less to do with the Inorganic Empire, than with the Organic. And it is a question whether on the original formation of *frames and cases for life*, this element was not largely created. For the sources of its existence in the earliest rocks, are not sufficient to account for the immense masses contained in Organic remains.

In the first chapter of this section, carbon was described as not active, but as the basis of combustion, holding a place in Nature, similar to that of the faculty of Eventuality in the mind. Carbon is the great illuminator and warmer on Earth. It is a type of life, which is also illustrated in the remainder of the Elements, in its other characters.

But we have now to deal, with a most complex series of natural and artificial operations; namely the destructive distillation, and slow changes, which Organic substances undergo. Tar is one of the most important of the gross products, of the destructive distillation of organic matter. When wood is put into a retort and heated to a high temperature it yields tar among other substances, which is usually condensed in the receiver. The tar of the wood-vinegar maker is mostly procured from dry beech-wood.

The appellation "Tar," is applied to seamen probably because they are coarse, rude "bodies," and possess a variety of qualities, good and bad ; but all characteristic of "ship-board."

The substances obtained from coal-tar are very various, some being solid and others unctuous to the touch. These different constituents, may illustrate the varied characters of sailors.

Benzine or benzole, is one of the volatile constituents of tars and their oils ; from which it is obtained by careful distillation. It is the great solvent for grease, now in vogue ; being one of the few substances that will move fats, when they have settled in awkward places ; which may be *couleur de rose*, or the most delicate hues, which the warm sun, has called forth brightly and happily. But this benzine only appears to brighten these roseate and evanescent tints :—it evaporates and leaves a clean field more lovely than before.

Having considered the "Chemical Elements" and their combinations as illustrative of the Mental faculties, Emotions of Man and his Traits of character ; let us consider in conclusion, how far the chemical processes illustrate Mental Operations ; by which what is external to the mind is received into it.

The foundation of chemical knowledge, is based on *analysis*,

as is our consideration of mind, and its exercise and its results. We divide chemical analysis into two sections: the Inorganic and the Organic. The first, consisting of the elements of which the whole is composed, shows analogy with the Primitive Faculties of the Mind. The second, the complex Organic section of chemistry, shows resemblance to the complex, and highly compound character of Motives and Actions in Man; based as they are, on such a variety of compound elements.

Let us consider the different processes, by which these results are brought about; and compare Chemical and Mental analysis;—that is to say Analysis by the Mind. Both of these operations may be called "*Testing*;" a process by which the truth is supposed to be extracted.

The first reception of any external impression into the Mind, may be termed "absorption." This is analogous in chemistry, to the *acquisition* of the substance to be analyzed. The next step is "*digestion*" in both sciences. In chemistry, substances of a foreign or extraneous character are removed by "sifting" or "filtration." And in the analysis by Mind, a similar process is pursued; both are then fit for general "diffusion," without confusion. They are then not precipitated or thrown down, by their own "dead weight."

During the analysis of a subject or substance, it is necessary to keep it under control; lest it should fly off, or alter its character by "effervescence:" or become dry and uninteresting by "efflorescence." For it should retain its "crystalline or characteristic form," even after that refined process of analysis, "*distillation*." These different operations are all performed by Man. His emotions, his feelings and passions, all undergo processes, analogous to these chemical processes. These are performed on every emotion or feeling, independent of its character or nature. Just as every substance poisonous or wholesome, must pass alike through every chemical operation.

These processes appear to be recapitulated backwards and forwards during the extraction of truth, which like a subtle substance in chemical analysis, may easily elude the operator's grasp. It is seldom *pure*, but is mostly "adulterated" in the Mind. It passes through many torturing processes;—it is "sublimed" to the heights;—it is "precipitated" to the depths. It is "distilled" to remove it from earthy impurities; the very "spirit of envy" itself may be *sublimed* in a *retort*.

Truth will often "crystallize" and reflect prismatic hues; but it is *unstable* on Earth, like the salt that "deliquesces" in the mist, and "effloresces" in the sun. In "a state of solution," its form is lost, and it absorbs earthy impurities, to remove which it must be again "filtered." It is at last made clear, but requires

to be concentrated and finally "fused," which *unites* the hitherto scattered fragments.

All these processes are but those of "assaying." Not as exclusively applied to Metals, but to things in general, by which what is good and precious, is proved and separated, and what is valueless removed.

CHAPTER XVI.

THE MORAL PHILOSOPHY OF LIGHT.

LIGHT THE PRODUCT OF CHEMICAL ACTION—THEORY OF LIGHT—MORAL SIGNIFICANCE OF COLOURS—ABSORPTION OF LIGHT—ITS INTENSITY—VELOCITY—REFLECTION AND REFRACTION—THE EYE AND ITS VISION—PRE-RAPHAELITEISM—BINOCULAR-VISION—MICROSCOPE—CAMERA-OBSCURA—PRISM—SPECTROSCOPE—THE SEVEN SPIRITS OF LIGHT—POLARIZATION.

THERE is every reason to believe that Light is in most instances, if not in all, the product of chemical action, at a more or less remote date. By chemical action, we mean the action and re-action on one another, of Elementary bodies and their combinations. The light of the sun of our solar system, is the principal illuminator of the Earth. The sun was accepted by many of the ancients as the Deity, probably at first, from his being a type of the Creator and Enlightener of the World. The earth and its kindred planetary bodies revolve round *a sun*, the type of the Son of God ; while beyond "our solar system" is probably a larger and more Universal System ; vaster, more inclusive and holding within it our sun and all its numerous planets. The centre of this system is as yet beyond our ken ; it is the type of the THRONE OF THE SUPREME, round which all creation revolves. This throne is superior, more exalted and universal, than the Throne of the "Son of Man." That such a centre of creation does exist, is probable in a degree approaching to certainty, and is in harmony with the "discoverable and the revealed."

This Chemical Action which we think the source of light—the result of elementary or compound elementary re-action, is highly typical. Physical light is the type of Instinctive, Intellectual, Moral and Spiritual light ; and the chemical elements which produce light, are the type of the means by which this living light, illuminates sentient beings. The theory propounded by Sir Isaac Newton of light being *emitted* by bodies, and of its passing directly itself to the retina of the eye ; has to be contrasted with the theory of *undulation*, by which light is supposed to vibrate like sound, in consequence of excitement

instigated by the illuminator. Both theories are probably true to a certain extent. The first being made the basis ; while the "undulatory" process, where it occurs, must be referred to mediums through which light passes, absorbing it irregularly, or in different degrees, which would however be included in the great theory of "Emission."

Moral light comes directly from "the Son of God," who is the *Illuminator*; and through the different ages that are passed since the commencement of "Revelation," waves of light have flowed onward. As physical light is seen to be composed of three elements, when viewed through a prism,—a three sided figure,—a tri-unity ; and by this is analyzed and better understood ; so in theology the doctrine of The Trinity—Tri-unity—renders intelligible to us much that is otherwise inexplicable in the Highest order of Knowledge. If it is the highest principle in theology that reconciles "unity and diversity" in Unity and Trinity ; one of the most important facts in Physics, is that white light consists of THREE coloured elements. These colours have a moral significance, which typify the attributes of Deity. They are red, blue and yellow. Red is the most warm, stimulating and heat absorbing colour, and typifies Judgment and the exercise of power generally. Blue indicates constancy, fixity and Eternity ; while yellow being the most luminous, typifies the enlightening influence. These show analogy with the characteristics of the "Three Persons in the Trinity."

The colorization of objects is in proportion to their texture as absorbing mediums ; that is to say these textures cause them to decompose solar light, and absorb the requisite colours from it. These different hues are typical of different views in theology, which are received diversely by different minds, according to their character. The "immense variety of shades of opinion," are continually contrasted with *shades* of colour. Superficial writers mention colours "existing in art, that are unknown in nature," which would be impossible if we consider colour in objects, due to the absorption of particular rays of light.

The absorption of light, is in proportion to the character of the *medium* through which it passes : relative transparency is the index of this. The atmosphere which surrounds the earth, possesses different degrees of transparency, varying with region, elevation and season. All these more or less, affect the passage of light ; as Moral elements do the light that is not physical.

The concentration of rays of light in physics as in ethics, requires a "focus," which is the point of greatest intensity or illumination ; yet this is but a small part of "the pencil of light." The Great Moral Illuminator of the world, like the great

physical illuminator, diffuses light *unequally*. Certain portions ; being lit more or less brightly, as in the outside lines of "the pencil : " while at the focus, it appears like a dazzling star. The "Star of Bethlehem," was but the focus of a much larger stream of light, soon to illuminate the East.

Light is said "to flow at right angles." We cannot view it through a bent tube of any considerable length, except with the aid of reflectors. Moral light is always direct, never oblique in its descent from above, but "a Moses" may reflect in his face a brighter light, than that of which he is the medium. No light intercepted is satisfactory as a guide. It may prevent total obscurity, but is not to be trusted like that which, comes directly from an object.

The intensity of light like the influence of attraction "is inversely as the squares of the distance," which is true also in Morals. For Nations, as individuals, receive their illumination greatly in proportion to the distance from their illuminator. The nearer an object is to the illuminator, the more intensely it is lighted. Light may either be diffused or concentrated. The same amount of light will brilliantly illuminate a small body, placed at a short distance from it, or a body four times the size in a less degree at double the distance. In the "Moral world," those who are nearest the source of light, receive the light in a more concentrated form, but it is more diffused when absorbed by those, at a greater distance.

The velocity of light is said to be 200,000 miles in a second, which for short distances is instantaneous. Heavenly messengers, move at a rate, which is probably inconceivably fast for short distances. Those who Spiritually, approximate to the source of light, receive it without any apparent break ; they are filled with it, in proportion as they approach it, until they so vividly reflect it that they not merely appear filled with it themselves, but are capable of diffusing it to others. The solar system comes in here to assist us by analogy. The sun is the principal source of light, without which all the planets would be dark. But as long as this influence is maintained, they are illuminated, and give light on the Earth.

The reflection of light is called "Catoptrics." Every substance on which light falls, is more or less of a reflector. Glass coated with tinfoil and mercury, or a polished surface of silver or speculum metal, or the surface of a liquid, are all "good reflectors." While lamp black ; black velvet ; or charcoal, are amongst the "worst reflecting" substances : being at the same time the most difficult to illuminate. These "good and bad reflectors of light" physically, illustrate the same Morally. Some individuals give forth much of the light communicated to

them, while on others it is to a great extent lost. White races, and light-coloured races, throw off much more light than black ones. Morality is greatly in proportion to hue. The Xanthous-haired Races are lightest, casting forth most "reflected light." The Yellow-skinned Races such as the Chinese, "reflect many rays of light," but not so many as the Xanthous-haired; while the Black Races, as yet "absorb" much light, but "reflect" hardly any. They do not "absorb light" in the same way as the White Races, that is to say so great a "variety of rays,"—analogous to their inferior Moral status.

Reflection is of Two kinds. The light in the first kind is thrown forwards, and in all directions, and is illustrated by the reflection, and subsequent diffusion of the sun's light, over surrounding objects, with the aid of the Earth's atmosphere. The second mode of reflection, is that of light in one direction, as from an opaque mirror. This "diffused reflection of light," is typical of the Universal diffusion of Knowledge more or less bright, according as it is reflected again from "the surrounding atmosphere:" while the second or mirror reflection, illustrates that from a confined centre.

Opaque objects intercept light if placed at a certain distance therefrom, and may be thus the means of hiding light, from objects much larger than themselves, but at a greater distance from the source of light. This reminds us, as has often been previously remarked, of small people and small teachers. Of priests and other "middlemen;" of "go-betweens" in general, who very often, although insignificant in themselves, yet, get into a position which is obstructive to the enjoyment and enlightenment, of other beings. How different is this from "reflection:" but their very obstructing influences, while they *hide light from some*, reflect light on others, which finds its analogy in a busy class, who would fain hinder the world from being "enlightened," EXCEPT BY THEM. They are "dark and obscure" to all but "a select few."

The same facts in Optics as in physics, have many different aspects, and each aspect has its special analogue in Morals. Concentration is necessary to success in a particular direction, but such narrows the application of force. If the mirror, an opaque, highly polished, reflecting body, illustrates this in physics, in human character it would be exemplified in the man devoted to success in a particular direction. "He reflects much light," and "throws off much light," but the angle of its influence is narrow. It is like physical light; which is enlarged in the convex, and contracted in the concave mirror.

Images may be multiplied to an almost indefinite extent, by mirrors suitably placed. The Kaleidoscope illustrates this

principle: a confused *mélange* is, by mere regular multiplications, reduced to order. What is chaotic and fragmentary, becomes geometrical and harmonious. A superficial view of physics, or a narrow angle of the Earth's circle, may show *disorder*; but "the union" of apparently incongruous corners, results in a Harmonious Whole.

Refraction is a deviation in the angle, from the "Normal angle," when light passes through a medium. This angle of deviation, may be measured like every other angle, in degrees, which differ, according to the form and character of the medium. Refraction assists in the diffusion of light, it renders objects visible out of the straight line of vision. The sun's light, by a refracting atmosphere, illumines a section of the Earth. The sun's image is sometimes actually visible, when we know it is below the horizon. The sun has set; but still its light illumines the horizon with glowing beams, which tell of glorious day passing, like the "brightest page of a nation's history." Long after the nation itself has ceased to exist "a refracted light" tells its story.

History is "refracted light;" through its aid we see an image of past days. To the historian the image is vivid, and sometimes is almost as clear as the reality itself. Optical distortions by refraction, as in the phenomenon of "mock-suns," occur. Thus the sky is illuminated by circles and semi-circles of light, which are larger, but much more indistinct than the great luminary. These "mock-suns," are types of images which the historian, conjures up of remote periods. He exaggerates the proportions of the objects he describes, so as to give them the appearance of being, notwithstanding surrounding gloom, of far larger size, than the *great illuminators* of the historian's *own day*.

The refraction at two surfaces, is illustrated by the passage of light, through that well-known class of objects called "lenses," which may be formed of any transparent substance. The object of lenses is to control the passage of light. The Human eye contains lenses, which are analogous to those used by the Optician. As it is through the eye that we can alone use optical instruments, we will take it as a basis in our Moral treatment of Vision. The eye is a mere optical instrument, like the telescope or microscope, through which apprehension comes of visible objects. The mind views them on the retina, through some mysterious process Unknown. The "mind's eye" is a hackneyed expression: for physical vision has long been held to typify mental vision. We shall endeavour to treat the subject analogically more in detail than has perhaps hitherto been done.

The eye possesses all the mechanical appliances, of a perfect

optical instrument. It has an outside case with "cap or cover;"—the socket and eyelids; while the different coats may represent "the tube" of the microscope or telescope. There is a crystalline lens; there is an iris which answers the purpose of a diaphragm; there is an aqueous humour which answers to "the first lens" of a telescope; while the second or "crystalline lens," is a double convex, a little flattened in front, as the aqueous humour is behind; all precisely analogous to an optical instrument of man's construction. The cornea, or external plate of the eye, which covers the "pupil" and "iris," answers to the concavo-convex lens. The eye has a most perfect set of muscles for moving it in various directions, like the "adjustments of a telescope."

The eyes of different individuals, vary in properties. The eyes of "long-sighted" persons are distinguished by the flatness of their cornea, while those "of short-sighted" persons, are by the reverse. Hence the use of spectacles, containing concave and convex lenses. The terms "long and short sights," are proverbial, as applied to Mental Vision, and "spectacles" to assist this sort of sight are also in use. They may be either adapted to the sight of the individual, or "borrowed;" in which case they may be unsuited "to the focus of his eye."

"Mental sight," varies even more than visual sight,—from partial blindness to perfect sight, nearly equally good and clear, for long and short distances. That is to say, its possessors have the power of altering the "focus of their eyes," in an eminent degree. This power physically, is equally perceptible "mentally." If the visual sight needs to be *adapted*, and the focus adjusted, to the amount of light, and the distance between the object and the eye focused; surely in Morals a similar process must occur. The size of different objects diminishes in proportion to the squares of the distance from which they are viewed. A similar diminution as the "squares of the distance," usually occurs in the "Mental view" of objects. The eye cannot at once, gaze on the details in a broad angle of view; a general idea, is all that we can hope to take in at a glance. "A detailed" or microscopic view is only possible, when very narrow angles come within the range of vision.

Two schools of painting represent these ideas; the first aims "at general effect in a picture," to the realization of a single view of objects, which in the broad angle usually chosen as a subject for the painter's art, discovers the principal objects "in detail;" and the subordinate in more "dim outline or shadow." The second, aims to depict natural objects "in all their minute details," such as are viewed by many careful microscopic examinations. The highest effort of art, would be to combine

the peculiarities of these two schools ; to give the prominence and due subordination to objects according to their relative importance in a picture ; to attend to the realization of the artist's idea : yet to give every object, the highest possible finish which naturally belongs to its position, with regard to "light and shade." Things great and small, should receive an equal degree of attention when treated morally ; but an attention of a character in harmony with the relative size of the objects. Every vessel to be full, the small as well as the great.

Man and the higher animals possess two eyes ; each of which—in man at least, affords a different angle of view, separately as "right and left hand perspective." But their union, yields an image in relief. This is the natural "stereoscopic image," the product of binocular vision : a subject little understood *for ages* even amongst the learned, but now in this present age is clearly seen, through the great light thrown upon it by the discovery of the stereoscope. In perfect binocular vision, a *single* image only appears. Our two eyes give us views of both sides of the object, as in Morals we are able to view "*both sides of a question.*" "A single eye" is mentioned in Scripture, and evidently refers to a straight view of things with undeviating steadiness or wavering to the right hand or the left ; yet "looking at both sides of the question." This is single-minded vision in contrast with double-minded vision, which in optics is illustrated by "squinting," or comparatively independent vision with each eye. The "single" eye of Scripture is Binocular Vision. One eye gives but *lateral* perspective.

The binocular principle is of general application to optical instruments, in use by both eyes, as more "relief" to objects viewed through them is given by its use. The use of one of the eyes in telescopic or microscopic observation, when pursued to the exclusion of the other, like the excessive use of particular sets of muscles tends to distortion, and consequent injury to the whole human system. This optical view, has its analogue in a one-sided mental view, injurious to the sight if pursued by a person with two eyes ; who by the simultaneous use of both, is a fair-judging person.

The magnification of objects, may be roughly divided into Two sections ; namely at *long* and at *short* focus. The magnification "at long focus," is chiefly that used in the telescope, that "at short focus" in the microscope. The great distance of objects, renders the first necessary ; while the second is rendered essential, by their proximity to the optical instrument. These two instruments, illustrate the different means available for the examination of truth. To Dr. Chalmers they afforded an illustration of the magnitude and the Universality of the

Power of God, equally applicable to the vastest bodies, and to the most minute.

The microscope reveals to us much that is otherwise invisible, it gives us an insight into minute details, in various divisions of Nature. The minute structure of bodies becomes known with the aid of the microscope, and by it we become conscious of the presence of forms, of the existence of which we had previously no conception. Almost every substance, has some characteristic form, even in the most minute state of division ; particularly in the Organic section. This affords a means for the analysis or detection of substances, to the examiners of compounds, natural or artificial, genuine or fraudulent.

There are two schools of philosophers, and two schools of physiologists, as there are two schools of painters. The first or microscopic school, dwells principally on what is near, what is minute, and perhaps invisible to ordinary observers. While the second mainly observes what is at a distance, considering the minute beneath notice, but dwelling rapturously, on the far distant, whose very *Distance*, gives it increased importance in its eyes ; and whose special interest, appears to be a want of connexion, with objects that can be analyzed and handled. This is the telescopic school. But the alternate study of these two methods of observation should be set before the mind ; that the materiality of the ONE may counterbalance the incomprehensible reality of the other. When the eye views through a powerful microscope a minute animal, plant or inorganic object, a cheese-mite becomes as large as a horse, or a grain of sand as a small mountain,—larger than the largest heavenly body appears to the unaided eye.

The camera-obscura, by an ingenious combination of a mirror and a lens, connected with a box darkened inside, yields on "the field," images of surrounding objects. By its aid photographs are taken, or a panoramic view may, be obtained of a landscape, with the aid of a suitably constructed camera, mounted on a situation to command the prospect. All optical instruments are blackened inside. The shade must be perpetually contrasted with the light, if things are to be clear and visible on Earth.

The prism which decomposes light, into its so called constitutional elements—the three primitive colours, is a three-sided figure a—Tri-unity ; which colours, typify the Three classes of faculties possessed by Man, as well as his threefold constitution. The blue may represent his Moral constitution, the yellow his Intellectual, and the red his Propensities. The combinations of these colours, form excellent popular illustrations of qualities in Man. It will be interesting, to trace the significance of some

of the combinations, of the three primitive colours. Yellow and blue form green, and typify the action of the Moral and Intellectual faculties,—refreshing and everlasting. Red and yellow, constitute orange, the type of the Propensities, acting through the Intellect. Blue and red, constitute purple which, typifies the Moral faculties, strengthened by the Propensities. Colours have been long held, to illustrate different Moral virtues: russet for instance, typifies humility. The most dull colours, are frequently compounded of the brightest, which may well point to humble merit.

The Spectroscope is an instrument with lenses and prisms, for the more perfect observation of the elements of light, than the ordinary prism affords. It is to that simple instrument, what the single lens is to the compound. With its aid much has been done towards the analysis of light. Flames of different colours are here reduced to their elements. From the coincidence of the colours of flames, arising from compound salts, and those of celestial bodies, similar composition has been inferred. This "spectrum analysis" affords a means of discovering the presence of the non-metallic elements in particular, in infinitesimally minute portions, hitherto beyond the reach of chemical analysis. The prism as we have before said, is a type of the Trinity, and its use illustrates the influence of this doctrine, in unravelling the mysteries of faith. Truths always, existing like the Rainbow from Genesis to Revelation. (Gen. ix. 13. Rev. iv. 3.) But not so fully unravelled in unscientific ages, until the "microscope" and "telescope" were added to the "prism." NOW WE VIEW THE STARS, WITH AN INTELLIGENCE FORMERLY UNKNOWN.

GOD is a *Unity* as well as a *Trinity*; and there are "Seven Spirits of God." (Rev. v. 6.) Light illustrates this, a Unity—Threefold—and Sevenfold. The harmony of colours is as great a reality, as the harmony in sounds. Certain colours contrast well, and relieve one another; as green and red; blue and yellow. This is analogous to the action of one quality on another Mentally; all tending to the maintenance of a harmonious balance.

The polarization of light, leads to results, the most wonderful in optics. Light reflected on a suitable surface, and made to pass at a proper angle on another surface, acquires new powers, although not visible to the naked eye. Applied to the microscope, polarized light brings into view in transparent objects, details of which ordinary observation, gives us not the slightest conception. To forms hitherto invisible, the most exquisite colours are given. This is due to the decomposition of light through its peculiar treatment.

By means of a magic lantern, a magnified and illuminated image can be thrown on a screen,—the principle is similar to that of an ordinary microscope. Painted slides, by mechanical contrivances, are made to assume the appearance of animated figures. Optical illusions, as they are made to appear and vanish, are supposed to account for the whispered mysteries of the invisible world, which men, alike in a civilized and savage state, dread. These optical “deluders,” are types of spiritual “deluders,” who would bring light out of darkness, and trifle with things of whose existence we are cognizant, but which are usually invisible. Such phenomena arise from that “light and shade” which at present surround us. THERE IS REASON TO BELIEVE THAT SHADE WILL DISAPPEAR,—THAT IT WILL DISOLVE INTO ETERNAL LIGHT.

CHAPTER XVII.

AGES OF MEN AND ROCKS CONTRASTED.

SIX DAYS OF CREATION—IGNEOUS-ROCKS—GRANITIC-ROCKS—SERPENTINE—
 PEBBLE-HISTORY—ASBESTOS—MICA—CLAY-STONES—PORPHYRY—BASALTS
 —VOLCANIC-ROCKS—THE DELUGE—RE-CREATION—NOAH'S ARK—ORIGIN OF
 SPECIES—METAMORPHIC-SYSTEM—THE SCROLL OF ROCKS—THE CAMBRIAN
 —SILURIAN—OLD-RED-SANDSTONE—CARBONIFEROUS—PERMIAN—JURASSIC
 —LIASSIC—OOLITE—OXFORD-CLAY—CORAL-RAG—KIMMERIDGE-CLAY—
 PORTLAND-STONE—PURBECK STRATA, AND THEIR TYPICAL SIGNIFICANCE.

GEOLOGY is the science which traces the history of the Earth, from the earliest period of its creation. It includes the past, present and future history of our globe; but writers have mostly dwelt upon it as elucidating the past. Few branches of science surpass geology in interest, or convey more important lessons. WHAT CAN BE, MAY BE; WHAT HAS BEEN, WILL BE; WHAT IS, HAS BEEN BEFORE; either in fact or in type. Therefore we think the so-called Geologic Ages before the Creation of Man, and the Seven Days of Creation mentioned in Gen. i. which succeeded them, to be Types of one another, and of the different Ages in the so-called "Historic period;" which we believe to have *commenced* with the life of Man on Earth.

"In the Beginning, God created the Heavens and the Earth." (Gen. i. 1.) We have no knowledge, and can form little conception of the date of this Creation, for a vast period must have indeed elapsed since this stupendous event.

"The Earth was without form and void, and darkness was on the face of the Deep." This was the Age of the Inorganic world; the Age of the earliest rocks. A dark world; a type of Adam created, fallen and dark.

"The Spirit of the Lord moved upon the face of the waters. God said, 'Let there be Light,' and there was Light." This was analogous to the hope given to Adam, after the dark state in which he was found.

The Second Day saw the division of "the waters above the firmament, from the waters that were under the firmament;" analogous to the separation of Heaven from Earth; the dis-

tance of Man from God having increased ; he had not access to the presence of God in the same manner as before his fall. He was not as it were surrounded by a spiritual fluid, which conveyed impressions directly from Heaven to Earth. Heaven and Earth were before in close proximity, which was analogous to the state of the material world, when sea and cloud were *all one*. In attempting to conceive of such a state of things, the mind itself "is at sea," but through the mist, beholds as the mariner does, the sea and the horizon as one.

Adam was turned out of his garden upon a comparatively dry, unproductive land. This was analogous to the dry-land which appeared on the Third Day. This Day saw the "Earth bring forth grass, and herb yielding seed," analogous to the multiplication of species among the race of Adam. On the Fourth Day, lights appeared. They were probably created on the typical day, and eclipsed on the literal days preceding ; for they must have shone on the Earth before.

The Sun is the type of the Son of God, as the Moon the great satellite of the Earth is of the Church ; while the twelve signs of the Zodiac, are types of the Twelve Apostles, and of the Twelve Tribes of Israel. These are the "eleven stars" of Joseph's dream (Gen. xxxvii. 9) ; he being the twelfth.

The Fifth Day saw the creation of whales, fish, and the animal life which swam in the sea, as well as the creation of fowls. This was analogous to the Antediluvian period, which ended in a flood of water. The Sixth and last Day, witnessed the creation of Man ; and as we believe that of those Plants and Animals, which are of the greatest consequence to him. God told him to be fruitful and multiply ; just as He told Noah. The Age of Noah, the first in which Man began to people the whole Earth, was an antitype of the creation of Adam ; man having got as it were a new start.

The Seventh Day saw the commencement of God's Rest ; and was a type of "the Sabbath of the World," of which the seventh day of the week was also a type, and was illustrated in the institution of the Mosaic-sabbath.

Inside this great system of analogies and types, there lies a smaller and narrower system of Circles, which illustrate progressive creation, in an analogous but somewhat different manner.

The First of the Six Days of Creation, is by this view believed to be a type of the Creation of Man on Earth ; as the Second is of the Age of the flood, and the Third of the Age of the building of Babel. While the Fourth is of the Period of the Patriarchs, and the Fifth of the Age between Moses and Nebuchadnezzar. The Sixth carries us from classic ages to modern times : the period when man has attained his highest state of

development. Formerly he was hardly a *Man*, merely a *child*, compared to what he is now.

The different objects in creation have been imitated by Man. The earliest remains of zoophytes, resemble in some cases the very patterns of his calico prints, either by accident or design. And his different handiworks, avowedly adaptations of natural objects, are *types* of them. NATURAL OBJECTS OFTEN ILLUSTRATE THROUGHOUT THE PROGRESSIVE AGES OF THEIR CREATION, the *steps* Man has made in manufactures.

We shall endeavour to trace the analogy between the "Days of Creation," and the different periods in the history of Man; as well as contrast Natural objects with Artificial; and prove that *Art is but a Type*, as it is an Imitation of Nature.

"All Nature is but Art unknown to thee."

In previous portions of this work, the author has endeavoured to trace analogies with Man in the lowest forms of animal and plant life; and upward to the highest in their respective kingdoms; and between modern chemistry and Mental philosophy; between Physical and Moral optics; and to trace in the geographical features and fauna of every country, what is in harmony with the qualities possessed by its Human inhabitants. In this division he will endeavour to show in confirmation of the fact of Man being "The type of Creation" and of This Earth especially, that the Geologic history of the Earth with its accompanying Minerals and Organic remains, typifies and illustrates the various periods of Man's residence on Earth, and the state of His arts. We shall consequently proceed to review the various strata, and contrast ages in "the Human Period," with "Ages" in rocks.

The Igneous-rocks, thrown up from "the bowels of the Earth" by volcanic agency, at an earlier or later date, contain no Organic remains, except those that may have got accidentally into them. They are commonly called "Unstratified," as they occur irregularly as regards superposition. They force their way through other strata to the surface, when acted on by subterranean forces.

Igneous rocks are frequently divided into three classes; the Granitic, the Trappean, and the Volcanic. The Granitic consists principally of rocks allied to granite, which is a conglomerate of mica, felspar and quartz; they together form a hard, compact mass of great density. Granite is one of the most enduring of rocks. The various materials of which it is composed, have no appearance of abrasion, such as would occur in minerals brought together in a watery medium. They were probably forced together by enormous pressure, at great depth in the



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THE NOACHIAN DELUGE.

earth. The granitic are the most deeply rooted of known rocks, forming the foundation of all other strata of which we are cognizant. Granite rocks are not necessarily "Primitive," although they are mostly found in Primitive Formations.

We see in the Igneous rocks, types of Man newly created, and just "planted" on Earth. His future movements were based on the status he then acquired, and were analogous to the superincumbent strata on the granite : it formed the foundation ; as it were "the table" on which movement and action took place.

Granitic rocks, long withstand time and weather. A coast bounded by them is only polished by the storm ; and a nation's history read in pyramids of granite, like those of Gizeh, or the monoliths of an Egyptian or Cyclopean age ; last from their earliest erection, to the end of a historic period ; and excite our wondering interest with regard to the architects of such great structures. They were erected in "primitive times" and suitably of primitive rocks.

The first of the Granitic Rocks is the *granite* itself, and the various minerals that occur with it. Some are of dazzling brilliancy ; while others contribute much to our comfort or convenience.

The minerals which accompany granite, are quartz, hornblende, mica, hypersthene, felspar, schorl, garnet, tourmaline, talc, steatite, chlorite, topaz, serpentine and many others.

Serpentine is a most important rock, the markings of some varieties of which are like a serpent's skin, while the veins of others resemble the undulations of a serpent's course. At the period when man first appeared on earth, "the Serpent" was very busy, and a *serpentine*-form has been worshipped in all the ages that have followed. Serpentine itself has long been a favourite material for articles of daily necessity or luxury. It is cut into slabs for inkstands, or as a mantelpiece presides at the domestic hearth ; its fine veins and markings, being so much the subject of admiration.

Felspar is another important mineral of varying transparency, and being rich in potassa, when disintegrated, adds greatly to the fertility of the soil. Plants whose ashes contain potassa, owe much of this alkali, to the decomposition of this mineral.

The disintegration of granite is highly significant as a type, and presents analogy with the generations of men. We have first the granite, which we may call the grandmother, by the destruction of whose matrix, the felspar is separated. Secondly we have felspar, which we may call the mother of kaolin. The third generation, is illustrated in the numerous applications of kaolin. These analogies are not altogether new, for the terms "matrix" among mineralogists, and "mother-liquor" amongst

chemists, as parents of metals or crystals, are of constant occurrence, and are an irresistible argument, for the never-to-be-forgotten tie, that links the sons of men to "Mother-Earth." The decay of minerals to form a soil for the growth of plants, represents the decay and death of Man, to leave room and provide resources, for the growth of The Man of the Higher race.

Quartz, one of the hardest and most important of minerals, is one of the most common constituents of rocks, and consequently its base Silicon must be a most abundant element in Nature. It is most frequently crystalline in form. Quartz or silica is the name generally applied to flint, agate, or other stones which are found in very varied strata.

The importance of quartz can hardly be over-estimated. It is one of the most solid of minerals, and in a clear form like that of rock-crystal, may be made one of the most dazzling in brilliancy, and cut into spectacles may assist our eyes to stem the current of years.

We hold pebbles to our eyes, and see in them the history of the different ages of the world typically represented. If the pebbles have their edges rounded, we exclaim that they have passed through a period of Conflict and violent contact with each other—like that process which polishes nations. If simply fragmentary yet crystalline, we see relics of a former state of advancement which has passed away. The broken angles which reflect light, illustrate that internal evidence which illumines the recesses of history:—THE HISTORY OF STONES IS READ IN THE STATE IN WHICH THEY ARE AT PRESENT.

Hornblende or amphibole is a most important rock, being found all over the world, and occurs in a considerable variety of forms and colours. Asbestos is a variety of amphibole; it can resist extraordinary temperatures without change or fusion, and is suitably found in Igneous-rocks. It is a type of immortality which is unaffected by fire. The corpse of a noble Roman was wrapped in a cloth made of Asbestos. According to Pliny, the body was consumed, but the ashes were kept together, so as not to be mingled with the ashes of the fuel—the type of that individuality which attaches to every human being. If the elements which he has used during his life, are needed on his demise for the support of new forms, still an immortal seed of life remains,—“the shadow” of a living being—“the ashes of a corpse.”

Mica is a mineral varying in appearance, being brown, green, or colourless. That from Siberia is of a brilliant, silvery white, and readily splits into plates, thinner than paper, in a remarkably even manner. It is often almost as transparent

as glass. It resists intense heat, and has little brittleness compared with glass or other minerals; very few of which can bear the least bending without breaking. Mica when added to other materials in stones, gives them the property of cleavage, and of shining in some instances like gold, for which it has frequently been mistaken. The micaceous rocks of the valley of the Oronoko, to the vivid imagination of Sir Walter Raleigh, appeared Mountains of Gold. The existence of the rocks containing this yellow mica, led to the belief in an "*El Dorado*" of the West.

The beryl, the tourmaline, the topaz, and the garnet, occur in this granitic strata, as do gold, silver, iron, copper, lead and most other metals. Sufficiently significant of a *primitive* period, when the elements and their simple combinations ruled,—types of Adam in the garden of Eden, when fewer "elements" were at work than afterwards appeared on the scene.

Trappean-rocks come next to the granites; the term "trap" being derived from *trappa*, which in Swedish means *a stair*. These rocks are thought to have been formed with the aid of water, and of the ashes or dust of volcanoes, forced into compact form by pressure, or deposited from turbid liquid, and lastly interspersed with veins of lava-like appearance, for they show evidence of fusion.

The Trappean and allied rocks, are usually associated with Secondary-strata; as the formerly spoken of Granitic are with the Primary. The minerals contained in them, are greatly those accompanying granite, but are of later formation, they are also rich in metallic ores. Porphyries accompany this class of rocks. As a class they may illustrate the World before the Flood; much irregularity and chaos, but still *steps* are seen, which lead to higher strata.

The Clay-stones, one of their most important constituents have a very earthy aspect, but when interspersed with crystals of felspar, form porphyry, a conglomerate—a type of Diluvian Society, which was composed of *two* Discordant Elements.

A finely-polished specimen of porphyry, has almost the lustre of a mirror, and is frequently of a bright flesh-colour. It is not a very distinct mirror, and the imagination must be exercised to enable the beholder to see brilliant images therein. Etty, in his painting of the world before the flood, "conjured up" real flesh and blood,—that Flesh and Blood which had disappeared beneath the Deluge, and laid them before our eyes.

Porphyry is a most durable material, it disputes with the syenite of Syene in Upper Egypt, the privilege of forming a part of the immortal relics of the past glories of "The Land of

Ham." This compound porphyry, by its very durability and extensive distribution in all countries, may represent the permanent and well-nigh universally spread notion of a Deluge. Porphyry is a remarkably hard and tough mineral, difficult to reduce to powder or break, and yet capable of being fashioned into ornaments.

Most of the cornelians, agates, chalcedonies and jaspers, are found among the Trap-rocks. They seal our letters, they burnish our gold or our silver, and are even "broached" on the bosoms of our fairest women. These stones represent Enochs, whose names are signets of truth, imperishable "breast-plates of righteousness" in an unenlightened age, worthy of being set in gold or silver to go down unchanged to posterity. Bad weather but little dims their lustre, as do evil companions those whose characters are of a pure and exalted kind. They may be smeared with filth, but soon wash clean.

Basalts are hard and dense among the Trap-rocks, they are of a very dark and dingy hue. They often assume most peculiar forms, appearing like columns, reared by man; such as those at the Giant's Causeway, or the "Ribs of Samson," near Edinburgh, and the far-famed Cave of Fingal. These masses of basalt, resemble the mightiest monuments of the hand of Man, and by their grandeur and rugged aspect, which resist many a storm, appear the strongholds or bulwarks of Giants, and are often said to have been the work of "Titans." The unscientific attribute them to the "Giants before the flood," and surely they present analogy to any works set up by man of a Gigantic character, and intended to defy the waves or the blast.

The Volcanic-rocks are eminently *Igneous*, but the expression is generally confined to rocks formed by volcanic or subterranean agency, since the close of the great Tertiary-period.

Volcanic agency is one of the most striking phenomena that the Earth affords, and exceeds in violence and terrific force, wind, rain or waves. Hundreds of miles of country have been shaken by earthquakes, evidently traceable to this volcanic agency; and thousands of square miles of land and sea, have been sprinkled with ashes, upheaved by the explosion of gases from that gigantic mortar, the crater of a volcano. Perhaps as high as Chimborazo where the sky touches the crater's mouth, or as low,—as in the case of submarine volcanoes, where the sea-water is only swallowed, to be vomited in disgust; with the contents of the crater's stomach, stones, pebbles, or the skulls of drowned mariners, to be scattered over the waves, until an Islet is upheaved for their graves.

The hidden fires within the Earth, reduce to a state of fusion

those "alkaline earths" and their salts, which ordinarily require the most intense heat known to the chemist. As they are partly cooled by earth, air or water, they effect their greater or less decomposition, and cause a violent ejection, either in the form of vapour, cinders or heated liquid. This process is doubtless what we call volcanic agency. These forces were anciently ascribed to "Pluto," and the term "Volcanic" is well known to be derived from Vulcanus, the god of fire. This agency like that of the tempest or the storm, *is but a type*—as it is admitted to be the expression of Divine Power.

The Deluge that occurred in the days of Noah, was as much *volcanic* as pluvius. "The fountains of the great Deep," were opened on the earth, which was the scene of a convulsion, the opposite of that recorded in Gen. i. 7, where "the waters under the firmament, were divided from the waters which were above the firmament." Noah's Deluge, was therefore but a return for a short period, to a former state of things. "The fountains of the great Deep" or hidden waters within the earth, were let loose, occasioned probably by the explosion of gases within "the Crust of the Earth," which was thereby broken. This force caused a temporary alteration, in the relation of the specific gravity of one portion of the Earth to another, as the clouds do to the sea.

There is no mention of rain before the flood. Hence it has often been inferred that there was none, only dew. This, if true would be an important type, dew being the emblem of earthly blessings, rising out of the substance of the Earth in the form of the mist, as was described to be the case in the garden of Eden. The rain which fell was a type of Spiritual agency; first in judgment as God's wrath, shown in destruction of life, and after the flood in blessing, as assisting the renewal of life which is compared to baptism (1 Pet. iii. 21)—a type of death and renewed life:—of an Earth which had passed through Death, but which was *restored* to life after the subsidence of the waters.

We hold creation to be *Progressive*, and all argument based on the examination of strata, tends to show that it is progressive towards Higher life. The animals and the plants "before the flood," were probably fewer in number of species than those after it, and their organization was probably less advanced.

We think it pretty clear, that after the Universal Deluge there was a *Re-Creation* of Animals and Plants, higher in organization than those which preceded it. Noah's deluge was the last of its kind, and the type of a future deluge by fire, which is to precede a New Creation as Noah's probably did. NOAH AND THE ANIMALS WITH HIM IN THE ARK, WERE

RELICS OF A FORMER STATE OF THINGS, CARRIED AS MEMENTOS INTO A NEW AND LATER STATE. Man at least will bear an analogy to this in a future Age ; he will be an *Imperishable* Relic from a Mortal World, which has passed away.

The destruction of the Antediluvian world, was probably by volcanic agency, which we consider the type of "the Flood" in Noah's days. The Volcanic-rocks are formed out of the materials of *earlier* strata which volcanic forces anciently broke up as did the flood the more Modern, and formed the connecting link between Older and Newer strata.—Those men who lived after the deluge were still descendants of Adam.

This view of a New Creation of animals and plants after the flood, consisting mainly of the species now existing, which are eminently adapted to diverse "centres of Creation," would remove many difficulties which have long perplexed students. They have justly enquired how an ark, 300 cubits long, 50 cubits broad, and 30 cubits high ;—or 525 feet long, 87 feet wide, and 52 feet 6 inches deep,* could accommodate the animals now known on the globe.

It is said with great truth, that the utmost that such an ark could have held, would have been 100 species of quadrupeds, 200 or 300 species of birds, and 5,000 or 6,000 species of insects and small creatures ; with the vast variety of food, living and dead, necessary for their sustenance. When we consider what menageries are, we feel convinced that Noah and his family must have been well employed, in looking after so great a variety of creatures, which could not have been collected from beyond their own district, instead of as some have rashly supposed, from all parts and to include all now known on the globe.

There are now known of species on the globe, from 6,000 to 8,000 Birds, 1,600 Mammals, more than 600 Reptiles, and some hundred-thousand Insects, besides innumerable plants, which could not stand *many months' submergence*. Also numerous fishes, marine and fresh-water, which could not exist together, and would therefore require RE-CREATION as well as the Plants, Land, Sea, and River-shells.

We hold the hypothesis of "a *Universal Deluge*," but not of a universal preservation of species in the Ark, only the preservation of those in the immediate neighbourhood of Noah to be types with him of a former state of things ; relics of the World which had passed away. This is analogous to a change in Man, called "Regeneration." The New Creation after "the Flood" was analogous to the New creation in Man, and to the

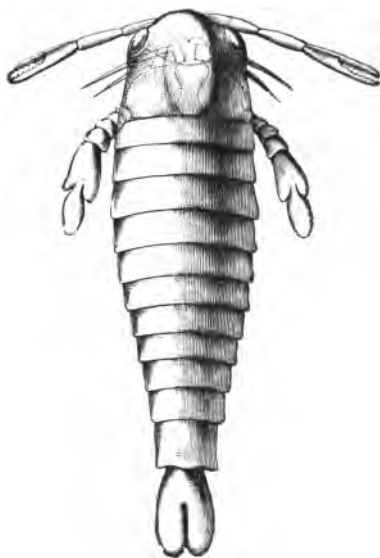
* We have followed the cubit of a man (21 inches) as it is most likely the earliest cubit in use, as it was a measure derived from the human body.



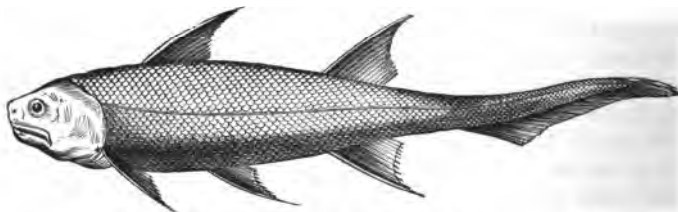
PRODUCTUS HORRIDUS. P. 431.



HEMICOSMITES PYRIFORMIS. P. 430.
SILURIAN ROCKS.



PTERYGOTUS BILOBATUS. SILURIAN ROCKS OF SCOTLAND. P. 430.



DIPLICANTHUS. DEVONIAN PERIOD. P. 430.

future new creation in Heaven and Earth. Even after the regeneration of Man, he still retains relics of his former state, just as Noah was accompanied in his ark by the animals belonging to a Pre-diluvian epoch.

The variation of so-called "species," would be explained, if we supposed a creation of thousands or hundreds of thousands of each species, with variations suited to the climate in which they were created, to be still further accommodated to circumstances as time rolled on. This is absolutely opposite to the Darwinian hypothesis, which supposes the existence *originally*, of a very small number of Species, *varieties* of which are the now so-called "Species."

The narrative of Noah and the deluge that occurred in his days, is a plain and simple one of natural phenomena, appointed for the destruction of the men and the fauna of the globe. We exclude miracles altogether, as not mentioned in the sacred narrative. The hypothesis of the preservation in the Ark, of all the animals now known on the globe, supposes that two of every unclean, and seven of every clean beast and bird were brought into one spot from the Arctic, the Antarctic, the Temperate and the Torrid zones: from the smallest insect to the largest quadruped; from the smallest humming-bird to the largest condor. It supposes the transport of all these creatures great and small; over rivers that they could not swim in, and over seas that they could not fly across or swim in.

This theory would also involve their being brought back to their respective localities, in the same way, at the close of "the Deluge." For as was previously remarked, there is a general adaptation to every country of its Fauna and Flora; its resources are in accordance with their wants. The climate of the residence of Noah as a general *rendezvous* for the beasts, would not be suited for those of all lands.

We think that the deluge of Noah was *not partial*, in opposition to the views commonly held by scientific men. For against the view of a partial deluge it is justly argued. That it is said in Gen. viii. 4, "Every living substance that I have made will I destroy from off the face of the earth." And that "the high hills that were under the *whole heaven* were covered," and that "*all flesh died* that moved upon the Earth; both of fowl and of cattle, and of beast, and of every creeping thing that creepeth upon the earth, and every man, all in whose nostrils was the breath of life, and all that was on the dry land *died*, and every living substance was destroyed that was upon the face of the ground, both man and cattle, and the creeping things, and the fowl of the heaven, and they were destroyed from the earth, and Noah only remained alive, and they that were with him."

It is frequently said that the terms "Whole Earth" and "Heaven," are often used to include merely the earth known to the ancients, and passages like the following are quoted. "The Lord God of Heaven hath given me all the kingdoms of the earth." (Ezr. i. 2.) "And there were dwelling at Jerusalem Jews, devout men out of every nation under Heaven." (Acts ii. 5.) These passages clearly refer solely to Human beings, and most others that are usually quoted to the same effect, apply only to the nations inhabiting countries known at the time. The terms used in Gen. viii. are much more exact and conclusive, than those in which Cyrus stated, that he was master of all the Kingdoms of the World.

The geological evidence for a partial deluge, has never been conclusively established, in connexion with any special *locality*. The animals of various classes and species, must have been let loose upon a land fitted to receive them. Green with herbage for the Herbivora, and abounding in animal life for the Carnivora. In fact a Fauna and Flora, RE-CREATED and arranged for them. They could not have immediately begun to devour each other, if only two or at the most seven existed of each species; which were still further decreased by those offered by Noah in sacrifice. Unless we accept this hypothesis, we must believe that the character and habits of the Carnivora were entirely altered, and those also of the Herbivora. Instead of feeding on vegetables they must have fed on *stones*.

Re-creation is a necessary hypothesis, unless we suppose that the Earth was a sterile waste when Noah went out of the Ark: FOR VEGETATION CANNOT SURVIVE SUBMERSION FOR MANY MONTHS IN SALT-WATER. If we accept the view held by Hugh Miller and other Geologists, of a partial deluge and preservation in the Ark of the animals of a particular district, still *Re-creation* is involved, as necessary for a provision of sustenance, for a carnivorous and herbivorous population.

Had the deluge been partial, Noah might have migrated with his family to another "quarter of the globe;" but it appears pretty clear that such an alternative was not available as it was with Lot in Sodom. The deluge was a judgment upon the *entire* Earth, in which God re-assumed the reins of government, Moral and Physical, and by one *great act*, divided chronology into two all-important epochs.

The principle of progressive creations, of the advance in each towards higher life, involves destruction and decay, as all physical growth does. This great principle, renders further *creation* after the flood, necessary as a part of that harmonious link, which connects the Age after "the Flood," with previous Ages.

The Race of Adam, although not positively newly created, yet received in the apparent *individuality* given to Shem, Ham and Japhet, what was analogous to a New Creation. It was so to speak a creation of THREE distinct varieties of Mind in Man, to be set simultaneously in the bodies of the Three great Fathers of the Human Race. MAN AFTER THE FLOOD, RECEIVED A FRESH START, AS WELL AS ALL ORGANISMS LOWER THAN HIM, OF WHICH HE IS THE TYPE.

The Metamorphic or Hypozoic-system containing strata of gneiss, quartz-rock, mica-schist and clay-slate, represents the period of Man's history immediately after "the Deluge," that is to say before the subsidence of the waters. It was a period when animal and vegetable life was greatly paralyzed, as at the time of the great flood of Noah's days.

The Gneiss, Quartz-rock and Mica-schist groups, are destitute of the remains of animal life, and are thus called "Azoic," that is *without life*; while the term "Hypozoic" means* *under life*; but still they are *preparatory* for life. The three kinds of strata, the Gneiss, the Quartz-rock and the Mica-schist, are as a whole less hard and dense strata, than the lower-granitic, and the crystals of the minerals which they contain, are smaller and less distinct. These strata show an evidence of the action of water or flood, which has worn and broken the crystals of felspar, quartz and mica they contain, this is apparent in Gneiss, and still more so in Mica-schist.

These different minerals, torn, divided and split in the flood or process of metamorphosis, may remind us perhaps of those individuals who were "cut off in the flood," and who lost their footing in the Antediluvian strata.

The Clay-slate is even more plainly of watery-formation, than the Gneiss and Mica-schist. It is an important group, for tablets of the slate, roof our houses. Slates however vary very much, some are quite unfit for roofing, being soft and inclined to crumble to powder, others so hard and brittle, as to be obstinate under the slater's axe.

We have now come to a very important period in Geologic history; to the strata where *life* begins. It is usually considered that the Paleontological period, commences with the Cambrian-strata, from no remains of animals and plants being found at an earlier date. The vast periods of time which have elapsed

* Against this we have to consider the recent discovery of the *Exoon Canadense*, in the Lower Laurentian rocks of Canada, which according to Dr. Carpenter and others is the remains of an organism to be classed with the Foraminifera; but the subject is as yet *sub-judice*. Should these remains be conclusively established as of Organic origin, still these strata in which they are found may not be so old as is commonly supposed.

from the first creation of Organic life, to the creation of Man, are types of one another.

Thus the oldest known seaweeds and Zoophytes, are types of the earliest state of man after "the flood," just as the creation of the highest animals beneath man, are of man's fullest development.

We shall draw analogies between successive strata in human society, and those in rocks.

The rocks are the recording scroll, the records which unfold the history of the Earth, the perpetual witnesses to what is past. They differ in texture, like the divers materials which record the chronology of ages. The earliest writing on papyrus and on the leaves of the palm, are the oldest writings extant, and are *analogous* to the Plant records in the rocks. After a while skins of beasts were used, typifying ages of Animal life. Is the "world in its dotage" that it is turned to grass like Nebuchadnezzar,—to record its deeds on perishable paper? Becoming more perishable in every generation. First we have Flax Paper, not calculated to last Ages. Next we have Cotton Paper, more perishable still. Lastly we have straw Paper, which will soon crumble to dust, together with its record:—it is thus with rocks.

As we judge of Ages in "the Historic period," by the men and their surroundings moral and material; that is to say their morals and mode of life; so do we in our review of geologic ages, base our estimate of them, on the animals and plants, characteristic of the period. Such are eminently analogies of Man, as their works and belongings, are of His arts and manufactures.

The degree of preservation in which fossils are found, varies much. Some retain a sharpness and distinctness, which notwithstanding their vast antiquity, make us fancy that they were but of yesterday. Others of later date, from being "water-worn," or "weather-worn," are less clear, and fail to produce that distinct impression on our minds, which fossils of an earlier date often do. The same remark applies to the records of distinct periods of history, which are often "not well preserved and clear," in proportion as they are recent: although as a whole, in history as in geology, the more recent records, are the most distinct. There are periods of "Drift" or Chaos in both; in which the records are irregular and of uncertain date; although a great mass of the material for the history of the time may appear.

The chroniclers of the different Ages of the "historic period," being the work of men who have once lived, vary in distinctness with the graphic power of the narrator, who is as it were the

mirror in which the events shine. The medium of the Geologic record, may be opaque or clear. It may be a hard and durable *Portland Oolite*, with ill-preserved fossils, analogous to the indistinct historian. Or clear like amber, embalming its heroes in all the solidity and beauty of life, or recent death; and imparting to each a distinctness, which inspires almost with the breath of life, the relics, even of an age which has EXPIRED.

The Cambrian-strata, formerly called the Transition or Greywacke, which so much abounds in North Wales, and Cumberland, exhibit but few remains of fossils. Only a few indistinct casts of seaweeds or Fucites, a small zoophyte (*Oldhamia antiqua*) allied to the *Sertularia*, a few worm-tracks, and the simple crustacean *Palæophyge*.

This Age may be a type of the earliest condition of Man "after the flood," of whose mode of life we have so few distinct records, but still sufficient to give us, as in the case of those early rocks, some idea of the beings that lived in those days, and their simple habits and pursuits. These were the beings that lived for the first few hundred years after the flood, before Babel was talked about.

These three distinct classes of organisms, the Zoophytes, the worms whose track we find (*Arenicolites*) and the Trilobites, represent by their different habits, the three Fathers of the Nations of this Age. We have Ham sensual and lowest in the scale, a mere "Zoophyte" amongst men. We have Japhet of the "Earth—earthy," inclined to burrow, and form his house in the earth or of the earth*—like worms. While Shem higher in organization, was immensely in advance of the other two brethren, if not in ingenious works, at least in Morals. This superior race is typified in the family of Crustaceans.

Should at any future date, the progress of geologic discovery throw back to a more remote period than that acknowledged at present, the date of the commencement of Organic life, such would be analogous to the change, which would come over the public mind, when it was discovered that the ancestors of the present races, carried their civilization to a higher pitch, than the moderns at present are willing to allow. Such would involve, but an earlier date for the commencement of analogies, between Man and Organic remains.

The Siluria of the ancient Britons, Shropshire, Radnor and Montgomery, distinguished for the great abundance of the now so-called "Silurian" groups of strata, tell of ages teeming with life, and busy activity, perhaps confined to the orders of *Fucites*, *Lycopodites*, *Lepidodendron*, Corals, Encrinites, Mollusca, Crus-

* The writer attributes the round mud-huts found in Northern Europe and Asia, to Japhetic populations, variously termed "Finnic," "Cyclopean," or Pre-historic.

tacea and Zoophytes. These show analogy to the condition of Man, in the days of the tower of Babel, the first great period of activity after the flood, when men began to execute great things, and were scattered over the globe, like this Fauna of Zoophytes, Crustacea and marine plants.

The Upper and Lower-Silurian rocks of Llandeilo, Wenlock and Ludlow, and their equivalents abroad, contain many organic remains. The fossils of this period are marine, but represent the bottom of the deep ocean, as well as of the shallow sea. No indication of a dry-land fauna occurs in these strata, and animals with a back-bone are entirely wanting, so far as research has gone. But it is "the Paradise of low forms of Life," there they lived, roamed, and died; and there their relics remained, patent proof of a lively and energetic population, whose representatives in the present age, still point back to them as types of classes, which flourished ages before; and which still attest the immortality of great classes.

These Silurian ages are types of the periods of the earliest Patriarchs, when those "Back-bones" of nations, powerful Despotic Monarchies were wanting.

The Old-Red-sandstone or Devonian system of rocks, is extremely extensive. These terms, although not exactly synonymous, yet refer to similar strata. The name "Old-Red-sandstone," is sometimes more subordinately applied, to that portion of the strata found in Scotland, of which Hugh Miller was so able a biographer. These strata in Scotland at least have been divided into groups, which generally exhibit characteristic fossils; unless as in the accompanying strata of conglomerates, they have been apparently washed away. Sandstones of a yellow or white colour, are accompanied by the remains of fish of *Diplicanthus*, *Holoptychius*, *Glyptolepis*, *Pterichthys* and others; but few remains of vegetables have come down to us from this remote period, they being of a more perishable character. Probably only the harder or more enduring stones, long retain their impressions. This is less the case with the more advanced divisions of this family of rocks.

In the Old-Red-sandstone we have the *Pterygotus anglicus* a gigantic crustacean, which probably measured five or six feet long. Far larger than any of its class now known to exist:—the *Inachus* of Japan, approaches it in size.

We have now reached the age of back-boned animals, which we think has its analogue in the age of the kings of Egypt and Assyria, contemporary with the later patriarchs.

The various genera of fish, illustrate different nations, who at this early period, adopted a despotic form of government. The *Cephalaspis* or buckler-headed fishes, remind us of Egyptian

warriors, whose shields were held up before the head as a guard. The *Pterichthys* and others of the box-fish class, are representatives of ages when armour was much used in war.

If the Vertebrata represent the great Kingdoms of Nineveh, Egypt and Elam, the Crustaceans do the great Sheiks, such as Job and Abraham. These crustaceans exceeded many fishes in size and strength; as much as the greater Sheiks like Abraham did the petty kings of Gerah, Sodom or Gomorrah.

The ferns whose graceful tracery, begins to show the evidence of a dry-land fauna, are types of civilization and culture, which in their allies the *Lepidodendrons*, became a type of the extravagant growth of special arts, which have never flourished to the same extent since. Such as some of those of the days of the earliest Pharaohs.

The Carboniferous system, is especially rich in that element carbon, the main constituent of the vegetable kingdom. Coal and mountain-limestone are its most characteristic rocks. The Millstone-grit is a third important rock of this formation. The Lower-Coal-measures or Carboniferous-slates, are next to the Old-red-sandstone in order of strata. They greatly abound in fossils such as *Lepidodendrons*, *Calamites* and *Stigmarias* among the plants. The *Lepidodendrons* were gigantic club-mosses allied to conifers. The innumerable tree-ferns are abundant relics of a luxuriance, carried to a greater pitch than that in lower strata.

As we rise to higher-strata, and as we approach our own times, we see organisms *rise higher*, attain higher organization; and Civilization amongst Men, rise in its Standard. Excellence in *certain arts* may be diminished; but as a whole, civilization must rise; and in each Age must a Higher Race come into view. These Lower-coal-measures, were not the Age of great reptiles or fish, although a few fishes are especially abundant.

The Age of Mountain-limestone, abounds in corals, *Euomphalus*, *Spirifer*, *Terebratula*, Encrinites and Madreporas.

In the coal generally, remains of reptiles are found; and slabs of sandstone from the coal strata of Pennsylvania, attest the presence at one time of a reptile with a frog-like foot; probably somewhat like a crocodile in shape. The climate of the coal-period, is thought to have been warm, damp and misty, from the arborescent character of the ferns, which appear to do best at present in this sort of atmosphere. The vegetation was mainly terrestrial, but still the presence of shells allied to *Spirorbis* (*Microconchus*), would imply at least brackish water; as in the strata about Shrewsbury. The presence of the shells of *Cypris* a fresh-water Entomostracan in the same locality, favours this.

Casts of fossil-trees in the form of tubes of coal, are found in these strata. The trunk is as it were formed of sandstone, and the bark of coal; by the falling in of which in the attempt to remove the coal, the excavating miner is often crushed. The fossil-trunk falls and kills the labourer; as a detached tree, would in its native forest. Many trees of the pine or *Coniferæ* class, attain a great height, as also the *Calamites* and *Lepidodendrons*; here is their metropolis. All this is characteristic of the Upper-coal-measures.

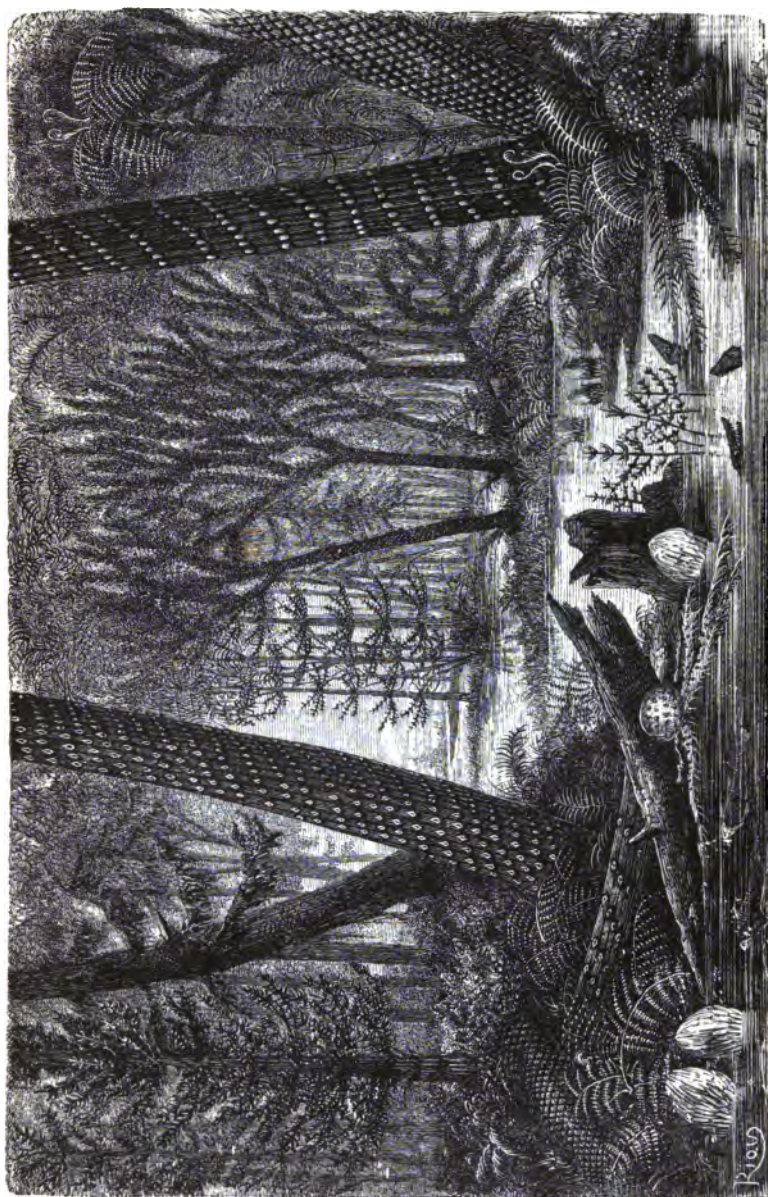
This Carboniferous-system, is a type of the Age between that which saw the commencement of great monarchies, and the beginning of the Israelitish-Kingdom. This probably includes the time of Cheops, who is said to have built the first pyramid. Art and Science had not as yet "flowered" in the same brilliant way they afterwards did. A little flower, analogous to that which the Conifers must have had, is a type of rising civilization. This coal or black period is a type of Hamite civilization or that amongst black races.

The Permian or Magnesian-limestone group corresponding with the Lower-New red-sandstone, are strata which succeed the coal-measures. The Crystalline or concretionary-limestone, is placed by Sir Charles Lyell *first*. (Elements, 1865, p. 457.) These strata contain numerous little shells, but are extremely varied in their character. Typifying historically, a period of change and disturbance, but not of violent revolution.

The Permian strata are further divided by Professor King in his account of the Permian fossils, into Brecciated-limestone, Fossiliferous-limestone, Compact-limestone, Marl-slate, and Inferior-sandstone of various colours. The Fossiliferous-limestone, contains corals, and the Compact-limestone, fishes of many species. True mammals have not yet been found in these strata: they commence in the Triassic—the first Age of Quadruped-mammals, a class of creatures which approach Man in many important physiological characteristics;—such as in the secretion of milk, warmth of blood; and in bearing living young.

The Permian strata, we consider by its intermediate character, typical of that period between the decay of Hamite-civilization, and the rise of the Babylonish-monarchy.

The Jurassic-group, contains many smaller groups, the lowest of which is the Lias, succeeded by Inferior-Oolite, Great or Bath Oolite, Oxford-clay, Coral-rag, Kimmeridge-clay, Portland-Oolite and the Purbeck-beds; all of which are more or less rich in fossils. The Lias is especially distinguished for the excellent preservation of the Organic-remains accompanying it. It is sometimes called "Gryphite-limestone," from the abund-



MARSHY FOREST OF THE COAL PERIOD.

ance in it of a shell allied to the oyster, which was termed by Sowerby, *Gryphæa incurva*.

The Lias is a stone little adapted for building, as it cracks, and falls to fragments on exposure to weather. The Crinoids of the Lias are numerous, and *Ammonites* also abound, as do numerous fish, or rather their fragments, such as *Acrodus*, *Hybodus*, *Chimæra* and the *Lepidotus*. One of the most remarkable bivalves is the *Avicula cygnipes*, of Phil., which somewhat resembles the webbed foot of the *Anatide* or duck genus; but the grandest remains found amongst the Lias, are those of numerous species of *Ichthyosaurus*, and a smaller number of *Plesiosaurus*, gigantic lizards or Saurians, which must have given a distinctive character to the whole period.

In the strata of the Lias above described, we see the predominance of great reptile forms. Amongst the Vertebrata they are the rulers of the Age. They typify the monarchs among men. We consider the period of Lias, typical of that of the Persian monarchy, and the great Saurians typical of the Persian Monarchs. The *Ichthyosaurus* might represent the Median; while the *Plesiosaurus* represents the Persian monarchs.

We have authority from Scripture and tradition, to contrast Nations with Animals; which have in all ages symbolized them by their characters and habits, and have appeared on standards as the representatives of nations.

The fishes allied to the sharks *Hybodus* and *Chimæra* may illustrate the Persian Satraps who preyed upon the husbandmen, as the great fishes did upon the smaller fry of their day. The Mollusca and lower forms, so abundant, may represent slaves; while the Crinoids by their elegance and complicated structure, illustrate arts, which were carried to a high state of perfection in those days.

The Inferior-Oolite, is especially rich in molluscan shells, numerous *Ammonites*, *Terebratula*, *Pleurotomaria*, *Rhynchonella*, *Ostrea*, and among the Echinoderms, *Collyrites*. The Fuller's-Earth with its accompanying shells, is found near Bath, as a sort of connecting link, between the Inferior-Oolite and the more characteristic Bath or Great Oolite.

The Great-Oolite contains the remains of plants, especially the Coniferæ; such as the *Araucaria* and *Podocarya*. In the Stonesfield-Oolite, remains of Marsupials are found, analogous to those so characteristic of Australia, which likewise furnishes in the present day the Araucarian pines, the contemporaries of these Mammals in our ancient strata.

A division of the "Great-Oolite," occurs at Bradford near Bath. The fossils are enveloped in clay, especially the En-

crinites, which has contributed greatly to the high state of preservation in which they are found.

The Oxford-Clay belongs to the Oolitic-group, it is especially rich in *Belemnites* and *Ammonites*.

The Coral-Rag is an important division of the Middle-Oolite, distinguished as its name implies, for the abundance of remains of the coral-class, which are accompanied by Molluscan-shells, allied to oysters, and a genus of whorled-shells termed *Nerinea*.

The Upper-beds of the Oolite are somewhat numerous. The rocks which furnish the stones so much in request for lithographic drawing, are those of Solenhofen in Bavaria. They yield fossils in an extremely beautiful state of preservation. Impressions of dragon-flies and other insects, lizards, fish and Crustacea, are here seen to the number of several hundred species, including many *Pterodactyles*, all of which were determined by Count Münster, as mentioned in Lyell's "Elements of Geology" (VIth Ed. p. 393). "The famous feathered enigma," considered by Professor Owen to be a true bird, and named by him *Archæopteryx macrura*, was found in the same strata. The portions of the skeleton found, approach the Saurians in many of their characters. Hence the scientific world were for some time in doubt, whether to call the newly-found fossil, the remains of a bird or of a reptile.

The Kimmeridge-clay contains much impure coal, or shale of a bituminous character. Many marine-shells are found in it. The small number of remains of plants which occur in it, have led some to believe that the large portion of carbon in these strata is from an animal source.

The Portland-stone so justly celebrated as a building-material, is one of the UPPER divisions of the Oolite. Numerous trees are found in it; but it is less famous for the fine preservation of its fossils than older strata.

The Purbeck-beds yield to the explorer many organic remains. They are divided into Upper, Middle and Lower-beds.

The Lower-Purbeck strata, contain many relics of fresh-water *Entomostraca*; especially of the genus *Cypris*. This is fresh-water marl, which is broken up in some places, as for example in Portland and the Isle of Purbeck. Above the fresh-water strata, lies a so-called "dirt-bed," which is a stratum of supposed vegetable mould, containing stumps of trees. These are various, some being clearly coniferous, while others such as the *Cycadeoidea megalophylla*, are allied to the *Zamia spiralis*, at present living in Australia.

The Middle-Purbeck strata, contain the remains of fish turtles and cyprides, which are believed to have inhabited fresh

water,—below which are brackish-water-beds, containing the well-known bivalve *Cyrena*. Fragments of the skeletons of many Mammalia, are found to accompany the Middle-Purbeck-beds, the anatomy of which have great affinity with the Marsupials of Australia.

The Upper-Purbeck or higher division, is rich in fresh-water shells, similar to those that at present occupy our lakes and rivers. Such as *Limnæa*, *Planorbis*, *Physa* and *Valvata*. And among the bivalves, *Cyclas* and *Unio*, with the Entomostracan *Cyprides*; and a few fish considered to belong to fresh-water genera. The Purbeck-marble, so much used for pillars in mediæval architecture, is discoverable by a metallic-ring, even when not easily recognizable by the eye. This is the case in St. Mary-Redcliff church, Bristol, where 400 years of smoke and dirt, have obscured the colour and markings of the pillars.

We considered that the Lias or earliest section of the Jurassic-group, is typical of the Persian monarchy. We shall endeavour to show how far the Oolitic groups, are typical of the great divisions of the Greek empire, and of the character of that nation, stern hard and extremely enduring, but capable of receiving "a high polish."

Like the fuller's-earth which adjoins this Inferior-Oolite (as at Bath), the Macedonian element, acted "as a detergent" among the more licentious and impure elements, yielded by other divisions of the Greek nationality. The Inferior-Oolite stone, is hard dense and compact, "like a Macedonian phalanx." The Great-Oolite is altogether a softer stone. It may illustrate the Greek Empire at the period of its greatest elevation, when it yielded numerous graces, the result of intercourse with the East; at the expense however of solidity, as contrasted with that of the Macedonians.

The Lithographic-stone, by the high state of preservation of its fossils descending to us from such a remote period, is typical of the clear-light in which we see historically the history of the Greek Empire. Greek modes of expression are even now imitated, and used to convey modern thoughts; just as the lithographic-stone, assists in reproducing the ideas of the modern graphic-artist. What is small and relatively insignificant in Greek history, may be compared with the impressions of insects preserved in the lithographic-stone; while the larger and more important fossils may typify sages and heroes. The fresh-water strata such as the Purbeck-beds, with exceptions, may represent the inland Greeks.

The genius of Phidias, exemplified in the frieze of the Parthenon, carved its individuality indelibly on this polished age. The "tables of stone" which adorned that building were the

perpetual records of a covenant of taste, made with the Athenians.

The Portland-Oolite by its hardness, and the relatively bad preservation of its fossils, may typify the Spartan division of the Greeks—their ruggedness and enduring qualities, and the ill-preserved relics we have of their antiquities. The Mammals, so characteristic of the Middle-Purbeck strata, may illustrate the “Dawn of Science,” or perhaps the analytical mode of cultivating it, practised by the Greek Sages.

CHAPTER XVIII.

AGES OF MEN AND ROCKS CONTRASTED.—*Continued.*

CRETACEOUS—ROCKS—WEALD—LOWER-GREEN-SAND—LOWER-CHALK—HASTINGS-SANDS — GAULT — BLACKDOWN-BEDS — CHALK-MARL — UPPER-CHALK — EOCENE — WOOLWICH AND READING-SERIES — LONDON-CLAY — MIDDLE-EOCENE—BRACKLESHAM-STRATA — ST. HELEN'S-SERIES—HEADON-SERIES—BEMBRIDGE-SERIES—MIOCENE OF ENGLAND—OF FRANCE—OF BELGIUM—OF GERMANY—OF CROATIA—OF SWITZERLAND—AND OF INDIA—PLIOCENE OF ENGLAND—BLACK-CRAG OF ANTWERP—RED-CRAG—NEWER-PLIOCENE—NORWICH-CRAG—PLIOCENE OF ITALY—POST-TERTIARY—GLACIAL OR DRIFT-PERIOD—RECENT-STRATA—STONE, BRONZE AND IRON AGES—CONCLUDING EPILOGUE.

THE Cretaceous rocks of Europe are divided into Upper and Lower, which we shall consider separately. The Lower-Cretaceous division or Neocomian, consists of the Hastings Sands, Weald Clay, Atherfield-beds, Kentish-Rag, Ferruginous-Green-Sand, and their continental equivalents. While the Upper, contains the Gault, Upper-Green-Sand, Chalk-Marl, and White-Chalk; and similar formations are found in other lands.

The Weald is an important formation, and lies at the foot of the Lower-Green-Sand of England. It is divided by Sir C. Lyell and others, into the Weald-Clay and the Hastings-Sand. The Hastings-Sand being the lowest, we shall treat it first. Many fresh-water shells such as *Paludina*, *Cyclas*, *Cyrena*, *Melania* and *Melanopsis* are found; also others that live in brackish and sea water; as *Corbula*, *Mytilus* and *Ostrea*.

Remains of plants such as *Sphenopteris gracilis*, are found in the formation, equivalent to the Hastings-Sand near Tunbridge Wells. The Weald-Clay contains the famous *Iguanodon*, the teeth of which possess saw-like edges. It was a creature of vast bulk, but is believed to have been a feeder on vegetables. The Sussex-marble found in these strata, is full of the shells of *Paludina*.

Much has been said of "The denudation of the Weald," and of the period and length of its occurrence. It is one of the most

important of geological processes. *They* typify the breaking up of Empires and nations, and the formation of new ones.

The Lower-Green-Sand, is a portion of strata, formerly believed to be older than the Gault. Some modern geologists call this Lower-Green-Sand, *Neocomian*. That portion of it which is exposed at Atherfield, abounds in large bivalve shells, such as *Perna Mulleti*.

The Lower-chalk contains numerous curious remains, such as the bivalve shell *Diceras Lonsdalii*, *Ancyloceras gigas*, and *Trigonia caudata*.

The Lower-Cretaceous and Weald-formations, we believe to be typical of the Roman Empire. The great shells of the Green-Sand, may illustrate the *As* or Bronze coinage of early Rome, as the *Diceras Lonsdalii* that horn-shaped bivalve, may the "little-horn," which typifies the power of Rome. The *Terebratula* in these strata, is shaped like the lamp of the Vestal-Virgin.

The *Iguanodon* and other great reptiles of the Weald, may be compared with the twelve Cæsars, many of whom were surely "cruel monsters."

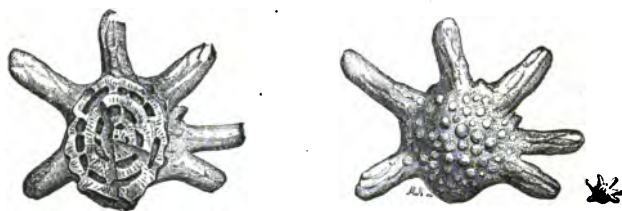
The Hastings-sands with its numerous fresh-water fossils, may illustrate the more effeminate condition of Rome and its less vigorous rulers, in the days when the Goths were first attacked; while "the denudation of the Weald," typifies the inroads and ravages made by them on the Roman Empire.

The Upper-Cretaceous-system is immensely rich in organic remains, embracing those of a great variety of orders.

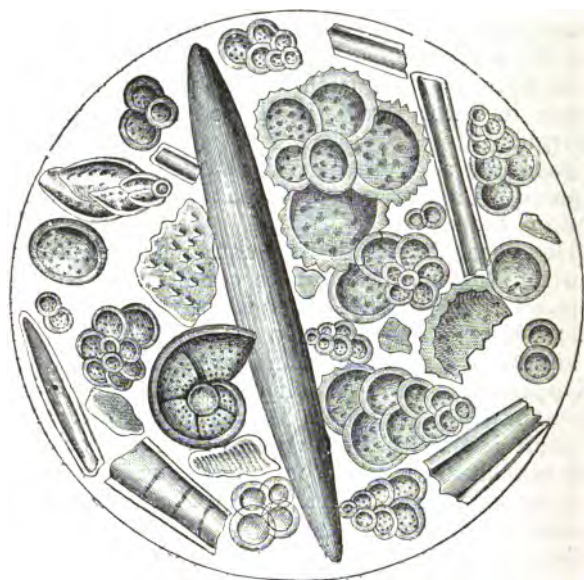
The Gault is the lowest division of the Upper-Cretaceous-group. It abounds in shells, especially the curious *Terebrirostratura*, with its long beak, and the large *Ancyloceras spinigerum*, a chambered Cephalopod.

The Black-down-beds of Devonshire, yield to the geologist, fossils not generally obtainable in other strata. The Upper-Green-Sand, is the successor of the chalk-marl in the south of England.

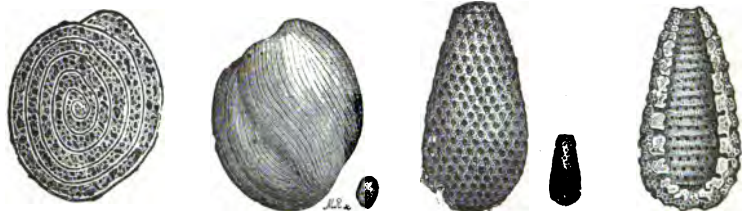
The Gray-Chalk or Chalk-Marl, contains large shells, such as *Turritiles costatus*, that great univalve, and some others. Mollusca, sponges and *Bryozoa*, abound in the chalk. Their forms are very numerous. *Terebratula*, *Crania*, *Pecten*, *Plagiostoma*, *Lima*, *Ostrea*, *Rhynchonella*, *Belemnites* and *Baculites*, are represented there among other Mollusca: and of Echinodermata, *Ananchytes*, *Micraster* and *Galerites*, of *Bryozoa*, *Eschara* and *Escharina*, and the sponge, *Ventriculites*. Of fish, the most important are those allied to the sharks, such as *Ptychodus*, clearly connected with the living genus *Cestracion* of Australia. A little fossil-wood occurs in the chalk, supposed to have been



SIDEROLITES CALCITRAPOIDES, FROM THE UPPER CHALK, NAT. SIZE AND MAGNIFIED.



FORAMINIFERA FROM THE CHALK OF GRAVESEND, HIGHLY MAGNIFIED.



FABULARIA DISCOLITHES, EOCENE OF VALMONDOIS.

DACTYLOPORA CYLINDRACEA, EOCENE OF VALMONDOIS, NAT. SIZE AND MAGNIFIED.

drift-wood, as this formation is believed to be marine. Bones of reptiles, as the turtle and *Pterodactyle*, are found in the Maidstone White-Chalk.

The Upper-Chalk is typical we consider, of the Eastern half of the Roman Empire, or that of the Greeks. Like the Newer-Chalk, it goes down to a much later period of time, than the Western Empire and its type the Lower-Chalk and Weald-Clay.

The fossils of the Upper-Chalk are much better preserved than those of the Lower-Green-Sand and Weald-Clays. They are the vivid records of the rocks, and have their analogues in the well-preserved Byzantine manuscripts, whose paintings are even illustrated in the prismatic hues, which sometimes adhere to the shell of some long-perished mollusc of the chalk. The *Turrilites* resembles in form the mitre of the Greek Patriarch, as the *Galerites* does a Byzantine-helmet; and the *Belemnites* and *Baculites*, arrow heads and lances. The sharks an exclusively marine genus of fishes, in these strata, illustrate the naval forces possessed by the Byzantine emperors, which greatly preyed on the resources of other states, as these great fish did, upon the Echinoderms and Molluscs, of their day. The *Mosasaurus Camperi*, a great marine lizard, whose skull measures three feet long, may represent the Emperors of the East, the successors of Constantine.

The great Eocene formation is divided into three, the Upper, Middle, and Lower-Eocene. These differ considerably like other formations, according to locality. Sir C. Lyell in his Elements, p. 295, has given a table of the French Eocene-strata, with their English equivalents; an arrangement which we shall adhere to in this important formation.

The lowest English strata of the Lower-Eocene division, are the Thanet-Sands. These contain species of *Cyprina*, *Scalaria* and *Corbula*. The French equivalent of the Thanet-sand, is the "*Sables de Bracheux*." The famous fossil skull termed *Arctocyon primævus*, Blainville, was found in this formation at La Fère in the Department of Aisne. This creature is allied to the bear in its structure.

The Woolwich and Reading-series, or "Plastic-Clay with lignite," is accompanied by *Cyrena cuneiformis*, and *Melania inquinata*; shells which indicate at least brackish water; while others such as *Unio* and *Paludina*, found in these strata, are shells indicating the presence of water, nearly or quite fresh. These strata in England says Lyell (El. p. 292), are believed to be of exclusively mechanical origin; while the French *Argile-plastique et lignite*, is a more regular succession of strata. In the *Argile-plastique* in the neighbourhood of Paris, *Melania inquinata* and *Cyrena cuneiformis* are found, and also *Ostrea*

bellovacina. At the base of the *Plastique-clay* at Meudon, in 1855, bones of a wader as large as the living ostrich were found, which has been called *Gastornis parisiensis*.

The London-clay is a formation *lower* than the lowest beds of the Middle-Eocene, being the *Uppermost* of the Lower-Eocene in England. The London-clay is very tough, and is either blue or brown in colour. The Septaria or Roman cement-stone, which is so much used for making the valuable waterproof cement, is found in the London-clay at Harwich. This London-clay greatly abounds in organic remains, such as fruits of different species of palms (*Nipadites*), the *Pandanus* or screw-pine, with fruits of the custard-apple, and of gourds, melons and acacia; all of which point to a climate such as now exists within 20° of the equator. Sir C. Lyell, El. p. 290, mentions that Dr. Hooker, observed numbers of the nuts of *Nipar fruticans*, floating in the river Ganges. These being nearly allied to the palm above named, as being found in the London-Clay, are an additional argument in favour of the general warmth of the climate, in the days when these now extinct palms, flourished on the banks of the Thames.—Bones of crocodiles, turtles and sea-serpents, are the accompaniments of the fruits and seeds of the London-Clay.

The fishes of this London-clay of Sheppey, are numerous. Agassiz describes fifty species: among them a species allied to the sword-fish (*Terapterus priscus*) and one resembling the saw-fish (*Pristis bisulcatus*). The accompanying Mollusca of these strata, are most analogous to those at present found in the seas of the tropics, such as *Nautilus*, *Cyprea*, *Voluta* and *Conus*. The large *Rostellaria ampla*, is represented by the little *Rostellaria pespelicani* of the British seas. The *Leda amygdaloides* and *Cyrtodon angulatum* are among the many bivalves found.

In these strata, but not certainly accompanying the marine fish and shells during life, we find the bones of land animals, both of birds and quadrupeds. The latter being represented by Pachyderms allied to the tapir and the pig. These floated down like the fruits of the palm, and were devoured doubtless by the great fish of their day, and their remains are cast up by the civilized man, to form an agreeable and satisfying "intellectual repast" for the modern geologist—an intellectual "shark."

The London-Clay has an equivalent in the Paris basin, as well as in the neighbourhood of Cassel-hill near Dunkirk. Somewhat lower strata, analogous in some respects to the London-clay, are found at Kyson in Suffolk, lying beneath the Red-Crag, and above layers of yellow and white sand. This Eocene-Clay contains remains of Mammals, particularly of

the genus *Didelphis* of the Marsupial class. Fragments of bats and serpents, of sharks and other fishes allied to them, are likewise found. Proving a great commixture of terrestrial and marine strata.

The Middle-Eocene is represented in England by the Bagshot and Bracklesham beds; and in France by the *Calcaire-Grossier*, and the *Soissonais-Sands*, or *Lits-Coquilliers*. The Bagshot-beds have been divided into three divisions. Firstly a layer of pale yellow sand; secondly a layer of dark green sand and brown clay; and thirdly a layer of the yellow sand under the clay. Generally no fossils are found in the Bagshot-beds; but in a few localities, marine shells of *Nummulites lævigata*, *Turritella sulcifera*, and *Venericardia planicosta*, have been obtained.

Bracklesham bay near Chichester in Sussex, gives its name to important strata, which contain many organic remains. A large sea-serpent (*Palæophis typhæus*), which Professor Owen thinks must have been more than twenty feet long, existed in the British Eocene-sea. It has some analogy to the great living serpents—python, boa and Hydrus. The bones of the tail, show analogy to those of the swimming-serpents, now living in the tropical seas. The gavial (*Gavialis Dixoni*, Owen) is found at Bracklesham, and various species of fish, such as *Mylobates Edwardsi* and spines of *Ostraceon*; both of which have their analogues in the fish now found in the Indian-ocean. Numerous teeth of sharks are likewise found, some of which are serrated, as those of *Carcharodon heterodon*, Agass. and *Galeocerdo latideus*, Agass. And among the teeth with plain edges, those of *Otodus obliquus*, Agass. and *Lamna elegans*, Agass.

The Molluscs are represented by *Pleurotoma attenuata*, Sow, *Conus deperditus*, *Turritella multisculata*, Lam., *Voluta Sel-seïensis*, Edwards, and *Lucina serrata*, Dixon.

The plants of the Middle-Eocene, are considered to have resembled those of India and Australia. They belong to the laurel, the fig, and the leguminous tribes.

The Upper-Eocene, is divided into three principal sections; of which the first is the White-Sands and Barton-Clay. They abound in marine shells, such as *Mitra*, *Voluta*, *Cardita*, *Terrebellum* and *Chama*. The French equivalent of these White-sands is the *Grès de Beauchamp* or *Sables-Moyens*, equally rich in shells of marine genera.

The Osborne or St. Helen-series, stand second in the Upper-Eocene, they abound in fresh or brackish-water shells, such as *Melanopsis*, *Melania*, *Paludina* and *Cypris*. The seeds of a species of that humble genus of plants, *Chara*, are also found. The Headon-series of strata, are found at Headon-hill, and White-cliff bay, Isle of Wight. They are of fresh-water and

marine formations. *Planorbis euomphalus*, Sow., *Neritina concava* and *Limnea cordata*, found at Headon-hill, are indications of the presence of fresh-water. While *Cerithium concavum*, is an indication of brackish-water, and *Cytherea incrassata*, is indicative of the presence of sea-water, during life. The *Helix labyrinthica*, Say., at present a land shell, living in N. America is likewise found at Headon-hill, which marks the connexion with terrestrial life.

Similar strata to the Headon, are those at Hordwell or Hordle-cliff, near Lymington, Hants. There fresh-water shells are likewise abundantly found; and mammals, reptiles and fish. Among them the remains of the *Palæotherium*, and *Anoplotherium*, of quadrupeds, and *Emys* and *Trionyx* amongst tortoises; *Paleryx* amongst terrestrial serpents, and several species of *Lepidosteus*, analogous to the bony pike, now found in the rivers of America.

The *Calcaire-Silicieux*, or *Travertin-Inférieur*, is the French equivalent of the Osborne and Headon-series. It contains land and fresh-water shells, but rarely if ever any bones.

The Bembridge-series, is the uppermost of the Upper-Eocene, it consists of clays, marls, and limestones; of fresh-water, brackish and marine formation. Professor Forbes says that these strata, contain the following organic remains. The Upper-marls yield *Melania turritissima*. The Lower-marls yield *Cerithium mutabile* and *Cyrena pulchra*, in the Mollusca. And amongst the *Chelonians*, *Trionyx*. The Green-marls contain species of *Ostrea*, *Arca*, *Nucla*, *Mytili*, &c.

The Bembridge-limestones, are of a pale buff colour, and are varied with layers of shales and marl. They afford land shells, as *Bulimus ellipticus*, and *Helix occlusa*. Also fresh-water shells, such as *Planorbis discus*, and *Limnæa longiscata*. And among plants, seed-vessels of *Chara tuberculata*. The strata in the neighbourhood of White-cliff bay, yield *Flabellaria Lamanonis*, Brong.—a species of fan palm, which is also found in the corresponding French strata.

The Binstead-Stone of Ryde, belongs to this Bembridge-Series, and has remains of mammals allied to the tapir and Rhinoceros, which are likewise found in the gypsum deposits at Paris. The *Palæotherium magnum*, *Anoplotherium commune*, *Dichobune cervinum*, and *Chæropotamus Cuvieri*, are examples of the genera found there. The French equivalent of this, is the celebrated Gypseous-Series of Montmartre.

The Eocene-period as a whole, illustrates the Gothic Period of History.

The Thanet-sands, lowest in the Lower-Eocene strata of England, with their little shells and their French equivalent the

Sables de Bracheux, in which the skull of the great bear was found ; may typify the period of British helplessness in the fifth century ; while the power of Attila the Hun, may be illustrated in that of this Great Bear—*Artocyon primævus*.

The period of the Woolwich or Reading-series, with plastic-clay and lignite, or mottled clays and sands, as an Age of Geologic-history, may typify the commencement of the Early Saxon period in England, and that of the Franks in France, to that of King Arthur in England, and to that of Clovis in France.

These strata formed in brackish-water, illustrate semi-marine habits in a nation. The clay represents the lower population, while the lignite, illustrates the terrestrial element or land forces ; which in this age especially, were intermixed with the marine.

The British Plastic-clays with lignite, are almost entirely of mechanical origin, and are much more heterogeneous and irregular in character than the French ; typical of the greater mixture of Gothic and Celtic nations in England, than has taken place in France.

The great wading bird *Gastornis parisiensis*, may illustrate Clovis himself, who first fixed his capital at Paris. Clovis was "a wader," but he waded through blood as well as water.*

The London-clay may illustrate a considerable period of British history, from the days of Arthur to the defeat of the Britons by Egfrid the Saxon. The fruits of the palms, pines, and other trees found in these strata, illustrate Celtic civilization :—these fruits resemble those of the East. Many Ethnologists ascribe to Celtic civilization an Oriental origin, mainly on the ground of resemblance.

The numerous bones of reptiles, turtles, sea-serpents and crocodiles, typify the mingled strength, weakness and depravity of this period ; as well as the aquatic habits of many of the population.

The sword-fish and saw-fish, found in these strata, typify savage rulers of the sea. These fishes are not like those found at present in British waters, but resemble the fishes of the Indian ocean. Tyranny on the ocean is more practised by Eastern nations than by European, whose early history is better illustrated in the present state of the Oriental Archipelago.

* The reign of Clovis was perpetual war. At twenty years of age he conquered Gaul by the defeat of Syagrius the Roman governor, and soon after married Clotilda, daughter of Chilperic king of Burgundy whom he afterwards dethroned. Through the influence of his wife he became a Christian and instituted that religion in France. In 507 A.D. he led his army against the Visigoths, and was for some time at a loss how to convey his army across the Vienne, until a ford was pointed out by a hind, when he waded across at the head of his army. On his conquest of the Visigoths he commenced a persecution which well-nigh extirpated them.

The Pachyderms of the London-clay, typify the monks who have been so often in later ages compared with swine. These thick-skinned animals, floated from other regions at the formation of the strata where their remains are found. The monks came from beyond seas. Their learning was great, but it frequently resembled that of "learned pigs."

The Septaria or Roman cement-stone, which is ground in mills for making the valuable fixing-agent, typifies the union of the various tribes to form kingdoms or great states. A whole building represents a great state, and the distinct stones represent the tribes of which it is formed. This did not take place in these early days, but was reserved for a later age. The Septaria is not the mineral which gives compactness to the strata in which it is found; for its useful properties in this respect, only came into exercise at an after period.

The Middle-Eocene, may illustrate the first half of the Saxon dominion in England, till Egbert.

The Bagshot and Bracklesham-beds, represent these strata in England. The Bagshot-Sands containing few organic remains may represent the indistinct and little-known portions of Saxon-history; while the Bracklesham-beds with their numerous and well-preserved fossils, like the Saxon-chronicle, give a vivid idea of the period to which they refer. The Bagshot-beds, consist of layers of pale-yellow-sand and brown-clay, which typify the union of yellow and dark-haired races,—the *Celtic and Saxon elements* among the population.

The sea-serpents of Bracklesham bay, typify "the Sea-Kings," their great size and power being highly significant of that of Human rulers. The Gavial and great fishes, such as *Mylobates* and *Ostraceon*, with the various species of sharks, may be compared with the different kings of the Heptarchy, who were conquered by Egbert.

The White-Sands and Barton-Clay, contain many shells of exotic genera, such as are now found in tropical climates. They illustrate the taste, for foreign luxuries which now began to be acquired in England among the Saxon kings.

The Osborne and St. Helen-series, being of fresh or brackish-water origin, typifies a period in Saxon history when the marine-forces were less in use, and more attention was given to the cultivation of the ground, as in the days of Alfred the Great.

As a general rule, we are inclined to think, that the Mammals when found in strata, are a type of the Christian period, or in ages before Christianity, of those distinguished for religious enlightenment. The great thick-skinned animals of the Headon-series, may typify priests and religious instructors; the greatest among them being the *bishops*; while the robbers, pirates, and

those the prey of superstition, may be illustrated by the fish and reptiles of the strata.

The Bembridge-series, the Uppermost of the Upper-Eocene, contains many fresh-water and land shells, with a few indicating the presence of brackish-water. The large numbers of the hog-family in these strata, illustrate the growing influence of the priests, as the Saxon period advanced. Those akin to the Rhinoceros may typify Archbishops, while the Pope himself is illustrated in a *future* Geologic-Age, by the RHINOCEROS WITH THE LITTLE HORN. Similarly Gypsum-strata at Paris, answering to the Benstead-stone, illustrate priestly influence in that country.

The great Miocene-formation, is less represented in the British strata, than any of the great formations. Some geologists would exclude it altogether. Sir C. Lyell (El. p. 237) thinks that the Lower-division, is partly represented by the Hempstead-beds of marine and fresh-water formation, and by the Lignites and Clays of Bovey-Tracey.

The Hempstead-series, contains many shells of fresh and brackish-water genera, such as *Cerithium*, *Limnæa*, *Planorbis* and *Unio*. The Pachyderm *Hyopotamus*, allied to the boar and Hippopotamus, is likewise found. The Lignites of Bovey-Tracey, contain many remains of plants, especially ferns, such as *Lastrea stiriaca*, and many conifers, as *Sequoia*; seeds of the grape, of several species of *Nyssa*, *Annona*, and *Nymphaea*; with leaves of laurels, figs, oaks and palms. The Leaf-beds of the Isle of Mull are believed to belong to the Lower-Miocene strata.

The Miocene formation in England, typifies the later Saxon period. The Leaf-beds of Mull, illustrate the days of the early Scottish chiefs, and of Ossian; one of the "green spots" in the barren field of early Scottish literature.

We shall now consider the Miocene-strata of different countries, which typify, we think their mediæval history. We shall commence with that of France.

The Miocene-strata of Bordeaux and the south of France, may be said in general terms, to illustrate the mediæval history of Aquitaine and Provence.

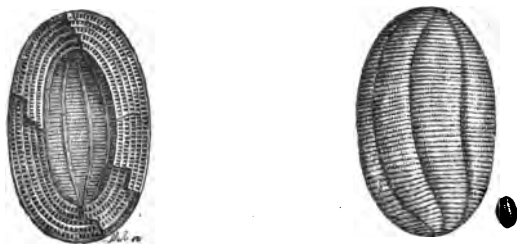
The Lower-Miocene, may represent its earliest history; while the Upper does that in the days of Elinor of Guienne;—that is to say the 12th Century.

The Upper-Miocene strata of Gers, is remarkable for the remains of the *Mastodon angustidens* and *Dinotherium giganteum*. Fossil apes have been found in similar deposits, as *Pliopithecus* and *Dryopithecus*. This last is believed to have been as tall as a man, to have lived on fruits, and to have climbed trees in search of them.

These great apes may typify the Capets; while the Mastodons and Dinotheriums who had as much or even more power than the apes, illustrate the *Maires* of the palace.

The Lower-Miocene strata of France, are very conspicuous in the Auvergne. This region has been a scene of great physical convulsions. Lakes covering a large extent of surface have sunk from view: mountains have arisen by volcanic agency; which has again assisted in the formation of new lakes. Successive formations of Eocene, Miocene, and Pliocene strata, are here found to illustrate the history of this region, one of the most picturesque in France.

The fresh-water strata found in the Auvergne, are arranged by Sir C. Lyell in four divisions (El. p. 221.) First the Sandstone, Grit, and Conglomerate, including Marl and Red Sandstone. Secondly Green and White foliated-Marls. Thirdly Limestone or Travertin, often Oolitic in structure. Fourthly Gypseous-Marls, which overlies green-Marl,—rich in the shells of *Cyparis*.



ALVEOLINA OBLONGA, EOCENE OF PARIS, NAT. SIZE AND MAGNIFIED.

The Upper-Miocene-Faluns of Touraine (Lyell, El., p. 210) yield many fossils, as at Louans, where portions of bones of the *Mastodon*, *Hippopotamus*, *Dinotherium*, *Chæropotamus*, Deer, Dolphin, Walrus and other Cetacea are found, but all are of species not now existent. The Mollusca of these seas, belong to genera more frequently tropical or semi-tropical, as *Fasciolaria*, *Conus*, *Mitra*, *Terebra*, *Pyrula*, *Oliva* and *Ancillaria*. The shells are very numerous; the large *Voluta Lamberti* is obtained there.

The age of the earlier kings who sprang from Hugh Capet, is here illustrated. The weak princes such as Robert the pious, may be represented by the overgrown Molluscs; while the greater, such as Philip Augustus, are represented by the powerful Quadrupeds above mentioned; and the Norman conquests beyond sea, are typified by the Cetacea.

The Belgian and British Miocene, are classed together by Sir C. Lyell, in his admirable "Elements of Geology" (1865,

p. 232); a work which gives a more complete and perspicuous view of the science, than any similar treatise, and which is more entitled to the name of "text-book" than any work so called.

The Lower-Miocene of Belgium, which occurs in the neighbourhood of Rupelmonde, ten miles from Antwerp, somewhat resembles the London-clay. It abounds in *Septaria* and shells of marine genera, such as *Nautilus*, *Corbula*, *Pleurotoma*, *Pecten* and *Cassidaria*. Teeth of genera allied to sharks as *Carcharodon*, *Lamna* and *Oxyrrhina*.

The Upper-Miocene of Belgium or Diest-Sands, contains few organic remains. Of these the shells of the *Terebratula grandis*, are the most conspicuous. Nyst, quoted by Lyell (p. 232), considers these Diest-Sands, contemporaneous with those of Edgehem. A considerable number of fossils are found in the Edgehem-beds, as Crinoids, Molluscs and Zoophytes. The supposed contemporary in Britain of the Diest-Sands, is the Ferruginous-Sands of the North-Downs in Kent.

The Upper-Miocene of Boldersberg in Belgium, resembles the Faluns of Touraine. The shells found therein are of marine and tropical genera, such as *Conus*, *Ancillaria*, *Pleurotoma*, *Cancellaria* and *Oliva*.

The Belgium and British Miocene strata, classed together, may typify the Belgæ amongst nations, who are found in both countries. The molluscs illustrate the lower populations, and the sharks the Counts of Flanders, of whom came Matilda the wife of William the Conqueror.

The Miocene formations of Germany are important. Those of the Mayence-basin, contain the remains of many marine shells, part of which are of similar genera to those now found in European seas, as are *Aporrhais* and *Pectunculus*. The "Sands of Epplesheim" are situated near the Mayence basin, they contain remains of the great quadruped *Dinotherium*.

The Littorinella-limestone, so called from its being almost entirely composed of these small shells, contains among the remains of other animals, those of *Hippotherium gracilis*, *Acrotherium incisivum*, *Paleomeryx* and *Chalcomys*.

The Upper-Miocene of the Vienna basin presents in its Organic-remains, a certain resemblance to the Falunian-sands of Touraine. The shells of Mollusca are there very numerous indeed, and many of these are identical or nearly so, with recent exotic species. In the lowest marine beds of the Vienna basin, says Lyell (p. 242), species of *Dinotherium*, *Mastodon*, Rhinoceros, *Listriodon* and the extraordinary Nummulite *Amphistegina Hauerina*, D'Orb., are found.

The plants are certainly not like those at present living in

Europe; but consist of Cinnamons, Cassias, *Platanus* and *Myrica*; plants that now exist in the tropics.

The Miocene-formations of Germany, split up as they are into local divisions, illustrate the Germanic states, as those of Vienna and Mayence.

The great animals allied to the Elephant and Rhinoceros, typify the members of the House of Hapsburg. Those having *one* horn or tusk such as the one-horned Rhinoceros, typify absolute power in the monarch; while those having *two* horns or tusks, illustrate the personal union of two crowns under one head, as has been continually exemplified in Austrian history.

The civilization of Germany in the middle ages, has often been said to be Oriental in its character; like the Fauna and Flora of the Miocene-age of that country.

The resemblance between the Upper-Miocene and the Touraine-Faluns, is typical of the alliance between the Hapsburgs and the French princes, some of whom fixed their Court at Tours. The Lower-Miocene formations, perhaps generally represent the tenth, eleventh, and twelfth centuries; while the Upper-Miocene represents the thirteenth, fourteenth, and a portion of the fifteenth centuries.

The Lower-Miocene beds of Croatia are highly interesting, a brown-coal is overlaid by strata abounding in shells of similar marine species to those of the Vienna-basin. Beautifully preserved plants, such as palms and poplars, occur in hard marlstone, with many insects, dragon-flies, grasshoppers, butterflies and termites. This brown-coal is lignite. The plants and insects are decidedly of Oriental forms; typical as has been before remarked, of Oriental proclivities in a nation.

The Miocene-strata of Switzerland have been greatly studied, and have afforded much instruction; they are otherwise called "*Molasse*," and have been arranged in three divisions; two fresh-water, and one marine. The marine and one of the fresh-water divisions in their organic remains, resemble the Faluns of Touraine. They are therefore referred to the Upper-Miocene. The Lower-Miocene is represented in the other division of these fresh-water strata.

The Lower-Miocene or Lower-Molasse of Switzerland, is of fresh-water formation, and is distinguished for the number of remains of plants it contains. It is subdivided into Upper and Lower.

The Upper-division of the Lower-Molasse, presents a resemblance to the Mayence strata, as the Lower subdivision does to the Aquitanian. Many plants similar to those living in North America, may be instanced, as the *Liriodendron procaccinii*, which resembles the tulip-tree—*Liriodendron tulipifera*, and

cornels, buckthorns, cypresses and fan-palms are likewise found embedded in these strata ; while their living allies are now in America.

The Lower-subdivision of this Lower-Molasse, is of fresh-water origin principally, but a few marine-shells are intermixed ; such as *Cerithium margaritaceum* and several others. This mixture of fresh-water and land-shells, always implies great terrestrial convulsions.

This Lower-division of the Lower-Miocene of Switzerland, contains remains of fig-leaves, which retain a large portion of their carbon. A long list of other remains of plants, might be quoted from among the reeds, conifers, ferns and *Protaceæ*.

There has been much controversy on the subject of the degree of difference, between the Miocene plants of Switzerland, and those now recent. Some hold with Professor Heer, as mentioned by Lyell (El. p. 262), that many of the species now living, may be the lineal descendants of those found in the Miocene-strata of Switzerland. The believer in the doctrine of the transmutation of species, would argue that the differences between the approximate species, recent and fossil, are to be accounted for by his favourite theory. A doctrine greatly fostered by the superstition, so general with regard to the supposed origin of species from *single* individuals or pairs, with one or two admitted exceptions.* VARIETIES WERE AS LIKELY TO BE CREATED AS SPECIES, ESPECIALLY AT LOCALITIES AFFORDING DIVERS GEOGRAPHICAL CONDITIONS.

The plants of the Swiss Miocene-strata, although found over only a small portion of the area of Switzerland, give evidence of a more numerous Flora, than at present exists in all that country. Three thousand flowering plants are believed by Professor Heer to have existed in the Miocene age, in Switzerland. This is a number far greater than now accompany, even the diversified elevations in that country. No part of Europe, yields so great a number of plants within so narrow an area ; nor do the Southern States of America with their semi-tropical climate. It may take rank with the richest portions of the West Indies or Brazil. The resemblance is great as a whole, between the American-Flora, and that of Switzerland in the Miocene-age. This resemblance is less with the recent Flora of Europe, Asia, Africa and Australia. A theory has been worked out, of a "Miocene Atlantis" or territory between Europe and America over which these Miocene plants are supposed to have passed ; which would involve a migration of plants, similar

* The theory of the origin of species (except man) from single pairs, finds no countenance in the Bible.

to "the migration of animals." This theory in this connexion carries us at once to the land of fable and walking trees.

The Miocene-strata of Switzerland is typical of that country in mediæval times. The cultivation of religion and morality, by the Albigenses and Waldenses among the passes of the Alps in the Middle-ages, are "the green spots" in the comparatively barren-field of Mediæval Church-history.

The geologist sees in the Miocene-strata of Switzerland, the realization of his dreams of a "Paradise of Plants:" as the moralist when he examines the history of these sects in early times, sees a luxuriant growth of the domestic and Moral virtues. The physical convulsions which brought the Miocene-strata of Switzerland to its present condition, may typify the forces, used for the subjugation of the Waldenses by foreign conquerors.

The Upper-Miocene strata of India, are highly important. The Siwâlik or sub-Himalayan hills, attain the height of 3,000 feet. Their strata are sandstone, shingle, clay and marl. Dr. Falconer, Sir Proby Cautley and others, have investigated these strata, and discovered many fresh-water shells, with the remains of important mammals and reptiles, in great variety. Such as the *Anoplotheria*, *Chalicotherium*, allied to the Rhinoceros; and the *Hexaprotodon* allied to the Hippopotamus; species of the *Hippotherium*, *Mastodon*, monkeys, giraffes, stags and antelopes, and the extraordinary four-horned *Sivatherium*, with the *Hyænarctos*, allied to the bear and the hyæna, and the *Enhydriodon* which resembles an otter of extraordinary size. To these we must add the *Machairodus*, a large animal allied to the cats. Ostriches are likewise found, which appears to argue the presence of a flat-country where hills now exist. Large lizards also once lived there, and a wondrous tortoise, estimated to have been 12 feet 3 inches long, by 8 feet broad and 7 feet high. This has been named, *Colossochelys atlas*. A few fresh-water shells found in these strata, have survived as species to the present day.

These strata in India illustrate Indian Mediæval-history. The shells which have come down to us, are like the relics of the ancient civilization of India. Much has passed away, illustrated by the extinct species; some are preserved, which may be typified by those species which exist in India in a recent and fossil state.

The larger animals now extinct, may represent the barbarous Dynasties which have passed away. The Pachyderms may illustrate the Moguls, some of whom like the Rhinoceros, are still recent, and may typify the later Emperors of Delhi. The *Sivatherium*, may represent rulers among the Brahmins; while

the mountaineers and hill savages, are illustrated in the hyæna-like bears, before mentioned. The ostrich, the camel and the giraffe, typify the fleet messengers, who in mediæval times, trod the sands of India.

The Pliocene-formation is better represented in Britain than the Miocene. It is divided by Lyell into Newer and Older-Pliocene.

The Older-Pliocene strata of England are divided into the White or Lower-Coralline-Crag, and the Red or Upper-Crag of Suffolk. The White or Coralline-Crag abounds in shells of Molluscs, corals, Bryozoa and Echini. All these organic-remains are immensely numerous; such as the *Astarte Omalii*, Lajonkaire, *Voluta Lamberti*, and *Pyrula reticula*.

These remains being all *marine*, typify maritime habits in a Nation. The fact of their belonging to the lower divisions of Organic-life, is suggestive of the lower state of civilization attained in the districts where this Crag abounds, as contrasted with the Metropolis, which although presenting older strata, contains more advanced forms of life.

The Black-Crag of Antwerp much resembles in its fossils the Coralline-Crag of England.

The Pliocene-formation in England, may illustrate that period of history which is partly mediæval, and partly modern;—through the reigns of the Houses of York, Lancaster, and the Tudors. That portion entitled “the White-Crag,” may illustrate English history, from the Saxon-period, to that of the Norman and Plantagenet-kings. The Tudor-period is much more distinct in English history. It is illustrated in the Red-Crag of Suffolk.

The comparatively small number of large fossils in the White-Crag, may typify the low state of arts and manufactures, in mediæval times.

The Red-Crag of Suffolk, or Uppermost of the Older Pliocene-strata, owes its bright yellow colour to the peroxide of iron it contains. It consists of quartz and sand, stained of a rich ferruginous colour. It contains many fossils, of which the most remarkable are the *Fusus contrarius*, *Purpura tetragona*, the recent *Nassa granulata*, and the recent *Cyprea europæa*. Remains of whales, such as *Balæna emarginata*, Owen, teeth of Rhinoceros, Tapir and Mastodon, *Carcharodon*—a gigantic shark, and *Myliobates* of the skate-family, are also found.

These great shells, may illustrate the “middle classes” in the bloodiest portion of the reign of King Henry VIII. Most of the fossils of this formation being stained *red*, may illustrate extensive shedding of blood throughout the country, both by executions and wars. Charles Brandon Duke of Suffolk was one of the most important characters at this period.

The reversed-whelk (*Fusus contrarius*) may typify the crooked policy of the mercantile classes, which would appear monstrous if viewed in the light of modern economic science. The gigantic sharks and formidable skate, illustrate the grasping courtiers of the reign of Henry VIII. The skate may be compared with flat-faced chancellor Cromwell.

The Rhinoceros with its "little horn," may typify the Pope and his great supporter Cardinal Wolsey; while the Tapir may illustrate the less prominent bishops, and the great Mastodon,—the monarch Henry VIII.

The mental inactivity of "the Middle-ages" in Britain especially, is typified by the White-Crag. The Antwerp-Crag is said to be of the same age as the Red and White-Crag of Suffolk, and may illustrate an analogous period of history.

The Newer-Pliocene of England, is divided into the Bridlington and Chillesford-beds, and the Norwich-Crag.

These strata in England may typify the period of the Stewarts, as the Older-Pliocene does that of the Tudors. The Bridlington and Chillesford-beds, believed to be about the same age, contain numerous recent and fossil shells; such as *Nucula Cobboldia*, and *Tellina obliqua*. In the Chillesford-beds, are found *Cardium grænlanticum*, *Lucina borealis*, *Cyprina islandica*, *Panopæa norvegica*, and *Mya truncata*—shells which are now found in the Arctic seas. The fossils of the Bridlington-beds, are similar but more exclusively Arctic in their character. Hence they illustrate the commencement of Arctic explorations, which first occurred in the days of the Stuarts. The whale fishery, then began to attract the attention of English navigators.

The Norwich-Crag is of a bright yellowish-colour. It contains a great number of fossils; among them many species now found in the British seas such as *Fusus striatus*, *F. antiquus*, *Cardium edule*, *Cyprina islandica* and *Turritella communis*. Which last shell resembling a little tower, may illustrate some of the steeples of Sir Christopher Wren.

The Norwich-crag as a whole illustrates the latter period of the Stuarts, who were partly contemporaneous with those who succeeded them; as part of this Newer-Pliocene is contemporaneous, with the so-called Post-Pliocene which is rightly classed later.

The *Mastodon arvernensis* may typify William of Orange, the most powerful Prince of the period, who reigned in these Islands. The fossils of this period are *stained Orange*, the colour of William's party.

The Newer-Pliocene of Ischia, contains many fossils such as *Murex vaginatus*, and *Buccinum semistriatum*. The first is still

recent, as a rare shell. Monte-Somma an old cone of Vesuvius, contains fragments of "Tuff,"—a stratum similar to that "of Ischia." The Eastern-base of Mount Etna, belongs to the Newer-Pliocene; it contains many shells, of which a moderate portion are identical with species now living.

The Newer-Pliocene of Sicily, extends over a large part of that Island. The greater portion of the shells in this formation, are to be found living in the seas of the present age, such as oysters, and a common coral now found in the Mediterranean, *Caryophyllia cæspitosa*, Lam. The *Pecten jacobæus*—that fine bivalve, is still found in the European seas, as also in the Newer-Pliocene of Sicily.

These rocks which form so large a part of the strata of Sicily, being of this modern date, and containing so few fossils of the higher orders of animals, typify the backward civilization of Sicily. The same may be said of the strata of Etna, Ischia and Vesuvius, which owe their elevation so much to volcanic agency; which illustrates the *sub-rosa* methods of accomplishing ends. These strata do not yield fossils of vigorous classes, genera or species, which points to a comparatively lethargic Human population.

The Post-Tertiary formation, according to Lyell's arrangement and that of other writers, is made to include extensive and divers strata. It is subdivided into the Post-Pliocene and Recent.

The earliest formation of the Post-Pliocene, is the Glacial-Drift of various countries. That of Norfolk is very important. The very name "Drift," applied to these strata is indicative of great irregularity.

If we examine a section of the coast of Norfolk, from Happisburg to Cromer, as it extends for forty or fifty miles, we find the strata in the following order. Firstly the Chalk and flints. Secondly the Norwich-crag. Thirdly the Forest-bed, where the roots of the trees, remain attached to their stumps in the vegetable soil in which they grow. Fourthly an important brackish-water series, accompanied by beds of lignite, and afterwards layers of fresh-water and marine-strata of sand and clay, and the shells of Mollusca, which are identical with recent species.

After this a fifth stratum of blue-clay, without Organic-remains, underlying the clay and boulder strata of the Glacial-age. Sixthly Drift much contorted, and lastly sand and gravel of superficial origin.

In the Forest-bed above mentioned, the remains of three species of the elephant are found, *Elephas primigenius*, *E. meridionalis*, Nesti, and *E. antiquus*. With these are found

the remains of *Rhinoceros etruscus*, *Hippopotamus major*, and *Sus scrofa*. Of the horse, bear, wolf, bison, Irish elk, reindeer, beaver, narwhal and walrus; some are extinct; while others are still living.

The brackish-water-series, contains masses of granite, syenite and other rocks, foreign to the locality where they are found. Some even being supposed, to have been brought from Scandinavia.

The layers of divers strata above mentioned, illustrate "strata" in human society. This is more or less true, as a great analogy, deduced throughout all geology. But the variety of layers in this Norfolk-drift, typify the numerous classes and their admixture, which was more characteristic of the age of the House of Hanover, than at any earlier period. The different classes of English society in those days, were formed of other classes more powerful in former times; which in some cases disappeared, and were replaced by these classes of later formation. In like manner, such strata as the Norfolk-drift, were formed of strata of earlier-formation.

The Glacial or Drift-period in Canadian geologic-history, is said to show a great resemblance to that of Europe. The different ancient strata of which it is formed, may typify the ancient Indian tribes, who were broken up, in the days of the House of Hanover.

The mountains of the Northern part of the Principality of Wales, are generally believed by geologists, to have been the centre of a great system of glaciers, which have been extinct for ages. These are believed to have occupied the seven valleys extending in various directions; to have been the means of diffusing fragments of rocks over localities to which they did not properly belong, and have left their traces over the ground, these floating islands traversed.

In the Drifts of Moel Tryfaen, Mr. R. D. Darbishire, as related by Lyell (Manual, p. 158), in 1863, discovered the shells of fifty-four species of Mollusca, and three Arctic "forms of species." All these were of species now living in the British or Arctic seas; the greater number being now found at a higher latitude. These fossil-shells, are found at an elevation, as high as 1,360 feet. This would prove the great elevation of the ancient sea-level.

Scotland has also its Glacial-period, which has greatly modified the features of the country. There is reason to believe that the Grampians were once occupied by a great Glacial system, which extended its ramifications in most directions. Large masses of ice, were doubtless the means of conveying to the coast much foreign strata, and many Organic-remains.

The shells which accompany the Scottish Drifts are very varied and indicate an Arctic climate, or one at least colder than that now existing in Scotland.

We may mention among the Drift-shells, *Pecten islandicus*, *Leda oblonga*, *Saxicava rugosa*, *Astarte borealis*, *Natica clausa*, and *Trophon clatheratum*, all of which are now found alive in the Northern seas. Extreme cold does not prevent the development of life, at least in certain classes of animals. Lyell mentions (p. 154) that Dr. Hooker found Crustacea, Mollusca and Serpula at depths of 200 and 400 fathoms, off Victoria land, between latitude 71° and 78° South.

The Scotch have not less *vitality* than other nations although *apparently* a cold people.

There are numerous tracts of land in Russia and Scandinavia, which show evidences of having passed through the Glacial period, besides those which present recent glaciers.

The polishing which the rocks receive in passing, by contact with icebergs and their freight ; illustrates the impression made on society by those divisions of the population, who come down from the mountainous districts, but who lose much of their individuality thereby. This was especially true in the days of the House of Hanover, who witnessed the Union of the Three Kingdoms ; and who also saw the disappearance of a great portion of that bitter feeling of antagonism among sections of the population, who were either of different origin, or had been long isolated.

Such a change was preceded by a still greater aversion, than existed in more quiet times. This was a period of doubt and uncertainty, analogous to that of " Drift ;" but we were nevertheless in this historical period " drifting " towards a more complete constitutional or popular government, whose divers elements may be illustrated, in the apparently confused strata of the " Drift," which presents many contradictory elements.

Limestone caverns are pretty numerous found in England, they frequently contain the remains of Man and animals intermixed, so as to lead many men of science to believe, that Man was contemporaneous with such animals as the cave-bear (*Ursus spileus*), *Rhinoceros tichorinus* or woolly Rhinoceros, *Hyæna spileus*, and lions. Flint implements which bear evidence of having been fashioned by Man, frequently accompany his bones, and those of most, if not all of the above-named animals. In some cases the floor of the cave inclosing these relics, is in a manner sealed with stalagmite.

If we are to admit that the Human-period commences here, it may illustrate the age when " the Rights of Man " first began to occupy attention ; but this was an age when his " heart was

as hard as stone." The mementos of those days are as imperishable as the stone weapons, and will go down comparatively unchanged to the remotest time.

The fluviatile-mud, is that substance to which many tracts of country owe their fertility. No description of strata is less fully formed, or more in *course* of formation than this. This is called on the Rhine "Loess," and contains numerous land and fresh-water shells, similar to those at present in being. Such as *Succinea elongata*, *Pupa musicorum*, *Helix plebeia*, and *H. nemoralis*.

This *descent of mud*, may typify the influence which nations in the neighbourhood of the course of a river, have on those nearer the sea.—Switzerland and those parts of Germany which adjoin the Rhine, much influence France and Holland.

The Post-Pliocene-period is an age, in which man is supposed to have existed contemporaneously, with the mammoth, the *R. tichorinus*, and with species of *Ursus*, *Felis* and Hyena. The flint weapons which accompany these remains, and which are apparently fashioned by Human-hands, present a great difference from those ground flints, which are usually assigned to the Celtic period. They are merely chipped by knocking against each other, and show a resemblance to those now used as hatchets, in some Islands of the Indian Archipelago. This subject is still *sub-judice*, and too uncertain, for us to attempt to found any analogy thereon.

We are now to consider the Recent-strata, or those in which the remains of animals and plants, are found of species identical with those now extant. To this period belong the so-called "Stone, Bronze and Iron ages of society," which have perhaps been in some instances, rather too hastily and distinctly defined.

This classification, appears to be essentially thus. Firstly the age of Stone-weapons and their accompaniments the skulls of a short-headed race, which have been termed "the Brachycephalic type," and which are clearly allied to those of the Mongolic race. These the author thinks to have been those Finns, relics of whom are still found in outlying districts of Great Britain and its Islands. Secondly the Age of Bronze—that of the short-headed Celts; which we think to have been that of the Iberians and of Celtic nations, before they were much influenced by the Romanic-elements. Thirdly the Age of Iron, that of the wedge-headed Celts, "the Dolichocephalous type." This was the age of the Celts, when intercourse with more civilized nations had taught them the use of iron. These Celts are probably the Gaelic type, for their skulls are *wedge-shaped*.

The Stone-period typifies the greater use of stone in roads, in houses and for ornamental purposes at the commencement of the present century than in the two following generations.

The Bronze-age exemplifies the greater use of brass thirty years ago than at present.

The Iron-age, is acknowledged to be pre-eminently that of our own day. IRON IS NOW TAKING THE PLACE THAT BRASS, BRONZE AND STONE FORMERLY DID.

AN EPILOGUE.

BEHOLD the vast sea ! Behold the waves roll,
 To the shore, to the shore—is their goal.
 And every wave revolving—breaks the coast,
 And every ebb returning, swells them most,
 Thus steps of progress in Creation's plan,
The Axis of Creation turns on Man :
 Throughout the ages—long before his birth,
 Before the age of life was born on earth,
 Right from the bowels of "*our Mother Earth.*"
 Progress glides onward as the rushing wave,
 Makes for the land—its master and its slave.
 And as a giant pouring out his soul
 Stakes his last drop of life—gives up his whole.
 And he must conquer—"conquer if he die."
 The contest rages ; and with one drawn sigh
 He stops for breath—the breath that's near his last,
 And gathers all his strength, though life may fast
 Slip from his mighty grasp—but this one *gasp*,
 Has been the turning-point in all his life.
 Even with this drawback, and with death so rife
 Approaching, his was a life of progress still
 He never turned his back, but faced the ill,
 But might recede a step, just as the waves
 When tide is coming in,—ever flowing
 Sometimes stepping back, when strength is growing.
 The impetus that grinds the pebbled beach.

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ETHNOLOGY AND ZOOLOGY.

PL. I. (*to face p. 65*).—*Photo* 1. Wallachian. 2. Man like an elephant, from Lavater. The individual mentioned in page 320 was much like this. Lavater calls it a portrait of a miser. 3. Tamil and Teloo goo catechists. 4. American-Indian woman and half-bred girl. 5. Heifers, from nature.

BOTANY AND ZOOLOGY.

PL. II. (*to face p. 89*).—Trees in Leigh Woods, Somersetshire; Elms, Cotham grove. This magnificent grove of trees we grieve to say will soon be cut down.

PL. III. (*to face p. 96*).—*Photo* 1. Fordingale Yew, said to be 2,600 years old; 2. Beech at Windsor; 3. Cup-moss (*Scyphophorus pyxidatus*, Hooker) from nature; 4. Lime in Moore park; 5. Chipstead elm; 6. *Conferva nana*, after Sowerby; 7. Moccas park oak. *Photos* 1, 2, 4, 5, 7 are from the plates in Strutt's "*Sylvia Britannica*."

PL. IV. (*to face p. 97*).—Tintern Abbey, west front. (See ivy, p. 98.) The custodian assured the author, that the Abbey suffered greatly in consequence of the ivy growing deeply into the stone; and he expected it would be all down in a few years.

PL. V. (*to face p. 112.*). BOTANY AND ZOOLOGY.—*Photo* 1. *Atropa belladonna*, after Woodville; 2. Socotrine aloe (*A. socotrina*), after Woodville; 3. Death's-head hawk-moth (*Acherontia atropus*), from nature; 4. Cone of cedar of Lebanon and pod of carob, from nature; 5. Molucca crab (*Limulus* species) and *Musca Cæsar*. Some of the untouched photos of this fly show a faint trace of the original green and blue colours of the fly. 6. Car-boniferous plants; 7. Portuguese man-of-war (*Physalia utriculus*, &c.).

PL. VI. (to face p. 120), LOWER FORMS OF LIFE.—*Photo 1.* Sea anemones; 2. Diatoms; *Gomphonema capitatum* and *elongatum*; *Diatoma vulgare*; *Achnanthis lineare* and *coarctatum*; *Ambipetras antediluviana*, front view; *Orthisira spinosa*, front view, with globular and oval forms, found at Springfield, Barbadoes. After Hogg.

Photo 3.—Hydra on a stalk of *Anacharis*.

Photo 4.—1. *Porpita pacifica*; 2. *Velella lata*; 3. *Velella cyanea*; 4. *Physalia utriculus*, after Schmelz.

Photo 5.—Foraminifera from limestone, and *Polystomella crispa*, recent, after Hogg.

Photo 6.—1. *Volvox globator*; 2. A section of volvox showing the ciliated margin of the cell; 3. A portion more highly magnified, to show the young *Volvicinae* with their nuclei and filamentary attachments; 4, 5, 6, and 7. *Conservoidae*, showing their modes of growth.

Photo 7.—*Pentacrinus caput medusae*, after Fort Major Austin.

PL. VII. (to face p. 152).—Insects, from nature.

PL. VIII. (to face p. 160), FISH.—*Photo 1.* Sword-fish (*Xiphias gladius*), after Acarie; 2. Hammer-shark (*Zygæna malleus*) and Saw-fish (*Pristis antiquorum*), after Acarie; 3. Sturgeon (*Accipenser rubenus*) and *Chimæra monstrosa*, after Acarie; 4. Mackerel (*Scomber scombrus*) and Tunny (*Thynnus vulgaris*), after Acarie; 5. Coryphene (*Coryphæna*) and Pilot-fish (*Pompilius*), after Acarie; 6. Perch (*Perca fluviatilis*), after Oudart.

PL. IX. (to face p. 184), FISH AND REPTILES.—*Photo 1.* John-Dory (*Zeus faber*) and Boar-fish (*Capros aper*), after Acarie; 2. Fishing-frog (*Lophius piscatorius*), after Acarie; 3. *Testudo radiata*, after Klein; 4. Iguana (*Lacerta iguana*), after Klein; 5. *Testudo*, sp.; 6. Vipers (*Pelias berus*), after Klein.

PL. X. (to face p. 225).—Anne Hathaway's Cottage (wife of Shakspear); Arch of a Confessional; Chepstow Castle.

PL. XI. (to face p. 240), RELICS OF THE DODO.—*Photo 1.* Skull of Dodo at Oxford; 2, 3. Dodo at Vienna; 4. Head of Dodo at Oxford, showing the skin; 5. Foot of Dodo in the Brit. Museum. The above from Strickland.

PL. XII. (to face p. 240), RELICS OF THE DODO AND SOLITAIRE.—*Photo 1.* Copied from Sir T. Herbert's figure; 2. View of the Island of Mauritius, where the dodo once existed; 3. View at Rodriguez, where the Solitaire once existed; 4. Dodo, from a picture by Savery at the Hague; 5. Bones of Solitaire; 6. Skeleton of Dodo, from the Oxford specimen. All the above copied from Strickland and Melville's work.

PL. XIII. (to face p. 240), RELICS OF THE DODO.—*Photo 1.* Dodo, from Clusius; 2. Solitaire, from the only known representation in Leguat's work; 3. Leguat in his Island; 4. Dodo, after Savery; 5. Bones of the Dodo; 6. Bones of Solitaire. All these are from Strickland's work.

PL. XIV. (to face p. 240).—*Photo 1.* In the collection of the author; recently discovered at Mauritius and named by Prof. Owen as *femur*, *tibia*, *fibula*, and *metatarsus*. The dodo was first described by Van Neck, who in 1598 visited the Mauritius. Clusius (*Exotica*, 1605) figures the dodo, which latter we have copied in plate XIII. as Sir T. Herbert's, who visited the island in 1527. The dodo was seen alive in England by Sir Hammon

L'Estrange (see Wilkinson's ed. of Sir T. Brown's Works, vol. i. p. 391) The foot and head of the specimen now in the Oxford museum came from the Tradescant collection through Ashmole. The head and foot at Oxford, a foot in the Brit. Museum and head at Copenhagen, were until recently the sole known relics of the dodo; but a number of bones were discovered by Mr. George Clarke at Mauritius. The Solitaire of Rodriguez has been similarly extinct in the memory of man, but its relics are even rarer than those of the dodo; almost the sole notice we have of it is in the work of Leguat.

PL. XV. (to face p. 248).—*Photo* 1. Dodo; 2. Moorhens, from stuffed specimens; 3. Skeleton of osprey, from nature; 4. Great auk, from nature.

PL. XVI. (to face p. 248), BIRDS.—*Photo* 1. *Columba porphyrio*, after Traviès; 2. Bittern (*Ardea stellaris*), after Traviès; 3. Cockatoo (*Phalacrocorax sulphureus*), after Traviès; 4. Smew (*Mergus albellus*); 5. Great auk (*Alca impennis*), from a specimen in the Brit. Museum; 6. Hornbill (*Buceros rhinoceros*), after Traviès.

PL. XVII. (to face p. 264), THE RESEMBLANCE BETWEEN MAN AND ANIMALS.—*Photo* 1. Dr. Beecher and the lion; 2. Emperor Maximilian and the eagle; 3. Frenchman and frog; 4. Boy and rhinoceros; 5. Man and Camel; 6. Negro, whom Redfield gives as the prototype of the elephant; 7. Aztec dwarf.

PL. XVIII. (to face p. 280), QUADRUPEDS.—*Photo* 1. Kangaroo (*Macropus majus*, Shaw), after Schuler; 2. Brown bear, after Cuvier; 3. Beaver, after Roulin; 4. Zebra, after Roulin; 5. Pangolin, after Huet; 6. Walrus, after Pallas

PL. XIX. (to face p. 289).—*Photo* 1. Turk and Turkey-cock; 2. Man, in which it is not difficult to trace a resemblance to a pig. 3. This is believed to be a portrait of an American lady, who attended a recent meeting of the British Association for the Advancement of Science; and is considered by Redfield greatly to resemble the elephant. 4. Cows. The man and woman opposite (5) resemble these animals. The preceding plates and following are copied from a clever work, entitled, "Comparative Physiognomy; or, the Resemblance between Man and Animals," by Dr. James Redfield of America, published 1866. The author is pleased to observe the coincidence between some few of his observations and Dr. Redfield's; but the line of thought pursued by Redfield is confined to the resemblance between man and animals. A critique on his work by the author will be found in the *Anthropological Review* for April, 1868, Art. Physiognomy. But he was not aware of the existence of this work until his own was ready for publication.

PL. XX. (to face p. 304).—*Photo* 1. Man and donkey; 2. Man and goat; 3. Man and owl; 4. Man and ostrich; 5. Father Matthew and the dog; Man and horse.

PL. XXI. (to face p. 320).—The resemblance between man and animals, copied from "De Humana Physiognomania Baptistæ Portæ," 1650.

PL. XXII. (to face p. 320), ZOOLOGY.—*Photo* 1. Skeleton of osprey, after Roulin; 2. Tiger; 3. Bottle-nosed whale, from an original drawing by W. H. Bailly; 4. C'vet, after Roulin; 5. *Mus coipus*, after Traviès; 6. Kite, after Traviès.

PL. XXIII. (to face p. 377).—Crooked Fall, Vale of Neath, by Mr. John Taylor; Tintern Abbey reflected in the water.

PL. XXIV. (to face p. 377).—Conway Castle reflected in the water.

PL. XXV. (to face p. 416).—Eve at the Fountain, from the original statue in the Bristol Institution by E. H. Bailly, R.A.

GEOLOGY.

PL. XXVI. (to face p. 432).—*Photo 1.* Carboniferous fossils: *Lepidodendron obovatum*; *Calamites approximatus*; *Stigmaria ficoides*.

Photo 2.—From the Upper chalk of Sussex, *Pticodus decurrens* (1); *Cidaris marginata* (2); *Pecten striatitulus* (3); *Plagiostoma spinosa* (4); *Rhynchonella plicatilis* (5); *Terebratula semi-globosa* (6); *Belemnitella mucronatus* (8).

Photo 3.—Tooth of *Mastodon obioticus*, in the collection of the author.

Photo 4.—*Pterodactylus crassirostris*, Solenhofen.

Photo 5.—Jaw of *Hyæna spileus*, from Kent's Hole.

Photo 6.—Lias. *Avicula cygnipes* (1); *Acrodon nobilis* (2); *Gryphæa incurva* (3); *Ceradotus gibbus* (4); *Pentacrinus briareus* (5); *Pholidophorus Becbii* (6).

Photo 7.—Silurian: *Periechocrinus articulatus* (1); *Calymene Blumenbachii incurva* (2); *Euomphalus catillus* (3); *E. rugosus* (4). Tertiary: *Mylobates* (1); Fish-spine (2); *Voluta* (3); *Nautilus* (4).

PL. XXVII. (to face p. 433).—Exeter Cathedral, built of New red sandstone.

PL. XXVIII. (to face p. 432).—Wells Cathedral, built of Inferior oolite.

PL. XXIX and XXX. (to face p. 456).—Skull of *Rhinoceros tichorinus*, in the collection of the author; this was sent from Siberia; a woodcut and full description of it, are to be found in "Land and Water," 1 Feb., 1868.

PL. XXXI. (to face p. 448), GEOLOGY.—*Photo 1.* Tertiary: *Astarte bipartite*; *Balanus* on whelk; *Nassa elongata*; *Fusus contrarius*; *Buccinum Dalei*; *Pyrula reticulata*. Oolite: *Ammonites jason*; *Pleurotomaria elevata*; *Ammonites Brocchii*, *Rhynchonella serrata*; *Hemicidaris intermedias*; *Ostrea gregaria*; *Trigonia incurva*; *Apiocrinus rotundus*.

Photo 2.—Porphyry; Granite; Serpentine; Chalcedony; Petworth marble.

Photo 3.—Slab of Wenlock limestone. Secondary fossils: *Turritella granulata*; *Turbo moniliferus*; *Terebratula lura*; *Natica caurena*; *Cucullæa fibrosa*; *Terebratula*, *Exogyra conica*; *Ammonites interruptus*; *Turritellus costatus*; *Ancyloceras Phillipsii*.

Photo 4 and 8.—*Lepidotus minor*.

Photo 5.—*Holoptychius Flemingii*.

Photo 6.—Tertiary: *Cassidaria echinophorus*; *Cerithium*; *Conus antiquus*; *Lamna*; *Planorbis euomphalus*; *Unio solandi*; *Lamna*; *Cacharodon*; *Ancillaria buccinoides*.

Photo 7.—*Ichthyosaurus communis*.

PL. XXXII. (to face p. 449).—Stonehenge, from a photograph by Mr. J. Taylor.

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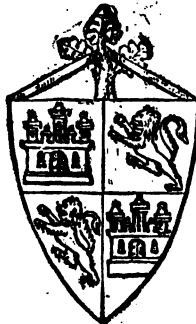
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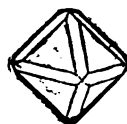
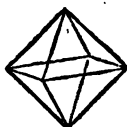
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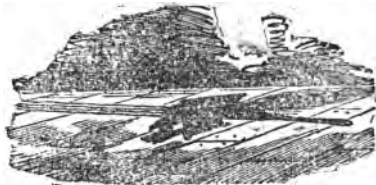
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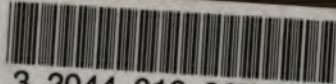
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